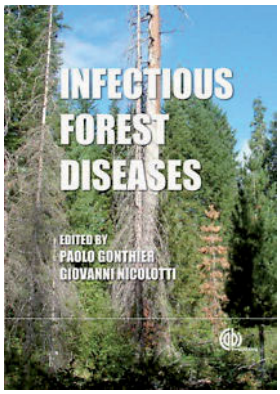
Infectious Forest Diseases

Paolo Gonthier and Giovanni Nicolotti (Eds). CABI. 2013. 672 pages. Hardback. ISBN 978 1 78064 040 2 €199



In recent times, forest diseases and pests have come to the fore due to their increasing frequency and intensity (see McCracken 2013 – this issue). This year alone several forest disease themed seminars have been organised, including many by the Society of Irish Foresters. How we respond to these disease threats is a key challenge for sustainable land-use and rural economics; indeed, the control and management of these plant diseases has been identified as one of the key challenges facing plant scientists in the current era (Grierson et al. 2011[1]).

The recent CABI publication *Infectious Forest Diseases* (2013), edited by Dr Paolo Gonthier and the late Dr Giovanni Nicolotti, both of University of Torino, Italy, is reviewed here. Superficially the book is an impressive tome, hard bound and numbering 672 pages. Furthermore, the book is rather expensive, at €199 from the publisher's website. However, some solace regarding the price can be taken from the fact that the publisher is a not-for-profit organisation, and that a portion of the funds generated are pumped back into plant health research and initiatives that benefit plant scientists and growers worldwide. Incidentally, one such initiative that may be of interest to *Irish Forestry* readers is the Plantwise web-based Knowledge Bank (www.plantwise.org), which includes a disease diagnostic tool and pest information sheets on hundreds of pests and pathogens worldwide. Furthermore, the system is a self-learning one, where users can input symptoms to identify the possible pests or pathogens - this information is then mapped, thus providing

[1] Grierson, C.S. Barnes, S.R., Chase, M.W., Clarke, M., Grierson, D., Edwards, K.J., Jellis, G.J., Jones, J.D., Knapp, S., Oldroyd, G., Poppy, G., Temple, P., Williams, R., Bastow, R. 2011. One hundred important questions facing plant science research. *New Phytologist* 192: 6–12.

updated information on the pathogens host range and global distribution to future users of the system.

To get back to the book, it is composed of 28 chapters authored by 57 experts in the respective diseases or specialists within forest pathology. These chapters are grouped into five sections:

- Introductory concepts;
- Non fungal forest diseases;
- Fungal and fungal-like forest diseases;
- Nursery diseases and Introduced pathogens.

From this description it may be apparent that the insect pests do not fit into any of the previous sections - the book chooses not to deal with these at all. In my opinion this is a good choice, not only because of the already large numbers of pages but also because insect pests of forests are dealt with sufficiently in other books. It is not practical to provide details on all 28 chapters, however, I will briefly expand on several chapters I feel would be of particular interest to *Irish Forestry* readers.

The first section contains only two chapters, the first dealing with the concepts of epidemiology of forest diseases and the second with general management strategies for coping with infected forests. Both chapters are important reading for the present-day forester, as they provide a good grounding in the general concepts of disease epidemiology in forests and of the methods used to control disease outbreaks. Chapter 1 is very well written, explaining the general concepts of disease epidemiology using real world examples abundantly throughout. Explanation of uncommon terms and the scientific language used makes this book accessible to the non-pathologists among us - indeed the book as a whole is made very accessible thanks to the frequent explanation of terms. Chapter 2 provides an overview to the current strategies for managing disease in forests. This chapter also sets the scene for the rest of the book, by outlining the general headings under which each subsequent chapter will proceed. The standard template used in all subsequent chapters, and the frequent citing of the other chapters within this book gives it a noticeable inter-chapter connectivity, which is in my view a trademark of good editing.

The disease chapters that will no doubt be of interest to *Irish Forestry* readers are the chapters describing pine wilt diseases (e.g. pine wilt nematode), *Dothistroma* needle blight (red band needle blight), foliar diseases of broadleaved trees (e.g. *Chalara fraxinea*), oomycete diseases (e.g. *Phytophthora ramorum*, *P. kernoviae*) and there is an entire section on root and butt rots (e.g. Fomes stem rot, honey fungus rot). As mentioned previously, all chapters follow a standard template, which greatly aids in navigation through this large and information packed book.

The penultimate chapter, namely Seed, Seedling and Nursery Diseases, is a vital inclusion to this book. As explained in the final chapter, Responding to Diseases Caused by Exotic Pathogens, nurseries and the plant trade are the main vector for the long distance spread of many exotic pathogens world-wide. The final chapter is one of my own personal favourites, written by a well-respected expert in modelling and forecasting population dynamics, Dr Marco Pautasso. This chapter highlights how the international plant trade network is one of the main factors in spreading

exotic pathogens (elegantly illustrated by the Figure on page 596). I also find this author's perception of the disparities in plant health monitoring across member state borders in Europe amusing, as he states that "Luckily different countries and cultures will tend to deal with the problem in different ways, a diversity to be welcomed because it could avoid the making of the same mistakes all over the planet".

On the whole, I am especially drawn to this book because of my previous experience in forest ecology. The book acknowledges that many of the pests dealt with only prove to be problematic when taken out of their own native ecosystems. In their natural habitat these disease-causing organisms play an integral part in regulating an ecosystem and in ensuring that diversity is fostered. A good example of this is how some species of *Pythium* (an oomycete) ensure that a tree's offspring do not succeed under the canopy of the parent tree – ensuring tree species diversity throughout the forest (see page 520). The book also encourages the use of species diversification to buffer against disease epidemics in forests, a strategy that would also increase biodiversity (O'Hanlon and Harrington 2011[2]).

In comparison to similar texts, this book compares very well. In my opinion the literature on forest pathology has been calling out for a book such as this for a number of years. This book provides an up-to-date summary of the developments in the biology and management of a number of important forest pests and diseases, focussing mainly on northern hemisphere temperate forests. It is here where I see the main value of this book lies. It can be difficult and time-intensive to keep abreast with the developments in the understanding of forest pathogens. There are several learned journals that regularly publish articles on forest pathology (e.g. *Forest Pathology*, *Plant Pathology, Phytopathology, European Journal of Forest Research)* and numerous others that include forest pathology within their broader remit (e.g. *New Phytologist, PLOS Pathogens, Forest Ecology and Management*). This book provides readers with excellent summaries on the current understanding of many forest pathogens, and three chapters dealing with general concepts of disease epidemiology in forests, disease management practices for forests, and exotic diseases of forests.

Two minor criticisms I have are the high price, and also the low coverage given to the ash dieback pathogen, *Chalara fraxinea*. This is a surprising fact given that one of the chapter authors is the scientist that first described this pathogen in 2006[3]; however, it is evident throughout that the books focus is on diseases at a larger scale than that of a single species. Still, these criticisms are minor and otherwise I find this to be an excellent addition to the literature on forest pathology.

Overall, I can recommend this book to *Irish Forestry* readers who have a keen interest in current forest pathogens – which probably includes the vast majority of readers.

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[2] O'Hanlon, R. and Harrington, T.J. 2011. The macrofungal component of biodiversity in Irish Sitka spruce forests. *Irish Forestry* 68: 41–54.

[3] Kowalski, T. 2006. Chalara fraxinea spp now associated with dieback of ash (Fraxinus excelsior) in Poland. Forest Pathology 36: 264–270.