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Book review

P.G. Ayres & L. Boddy (Eds.), 1986. *Water, fungi and plants*. Cambridge University Press, Cambridge. 413 pp. Price US\$ 89.50.

Water has an essential role in the relationship between fungi and plants, 'not just because it is the solvent of metabolic processes, but because it is essential for the transport of nutrients within and outside fungal thalli and plants, it has a vital skeleton function in both and a key role in the behaviour and spread of fungi'. These words from the preface of the book justify the organization of a symposium on these aspects of fungal and plant physiology and plant pathology. The symposium was organized by the British Mycological Society in April 1985 and this book, published as BMS Symposium 11, contains the papers presented at that symposium.

An almost overwhelming amount of information is brought together. It is hardly possible to regard the book as a unity, as its topics are rather diverse. The organizers of the symposium apparently have tried to cover as many aspects as possible, which led to some overlap of the text.

Most of the text is stimulating to read, with interesting comparisons made and unpublished results incorporated. But there are also some chapters with no new information or repetitions of previous chapters, though sometimes in another context.

The book begins with basic principles of water potential, water-holding capacity, osmotic pressure and relative humidity and how these properties can be measured. For readers not familiar with these aspects of plant physiology, this part presents a good survey, also indicating problems in their measurement. Chapter 2 gives similar information on these properties in fungi. In fungi, much less is known about turgor regulation and the significance of turgor as a driving force for water.

From the other chapters, let me draw the attention to the most interesting ones. Chapter 3 describes water relations in sclerotia, presenting an interesting summary of what is known. It is worth reading the arguments that sclerotia do not have a real state of dormancy and that their water content reflects that of the environment. Chapter 6 is a lively account of zoospore disper-

sal, movement and encystment. The information is clearly presented, based on data from well chosen examples. The same holds for Chapter 7 on water relations and pathogen activity in soil, with emphasis on *Phytophthora* and *Fusarium* spp. as models. Predisposition to water stress is the subject of Chapter 9 and the reader will find out how difficult it is to obtain experimental data as the various effects of water stress can hardly be distinguished. Examples are given of effects of water stress on disease development, but our understanding of the processes involved is limited. This is also true of the relations between decay of standing trees and variation in moisture relations (Chapter 18). Different fungi have different strategies of colonization and thus no general rule can be constructed about the relationships between these.

Interesting and also new information is given on infections by *Phytophthora* spp. in nutrient-film culture (Chapter 11). Besides the occurrence of specific problems in these systems, data are becoming available that can be extrapolated to soil-root systems. And this information will also then be useful for understanding problems in rock-wool cultures, a system much more in use in glasshouse crops than nutrient-film cultures. Unfortunately information on this type of culture is (still) lacking.

In other chapters, reviews are given on the effect of water stress on phytoalexin production (Chapter 12), on fungal infection and flow of water in plants (Chapter 13) and on the effect of rhizopathic (root-damaging) fungi (Chapter 14). With a limited number of pathogens as examples in the latter chapter, the author concludes that increased resistance to flow in the roots plays a major role in the development of water stress in infected plants. Mycorrhizae too affect water relations in a plant (Chapter 16). Although the plant root-mycorrhizal system is difficult to study in experiments, evidence is accumulating that mycorrhizae act as an additional root system and transport not only nutrients but also water from the soil to the plant.

Of interest too is the effect of leaf pathogens on water relations (Chapter 15). Such pathogens break the cuticle, the protective layer of plants for water losses; but shoot-root ratios are also affected, in part by excessive water losses. The water status of a plant influences the physiology of conidia of a leaf-inhabiting fungus, as is demonstrated with powdery mildews; conidia formed on a plant with water stress are better adapted to infect other host plants with water stress than conidia formed on plants without water stress.

Water also influences storage of harvested plant products (Chapter 19 and 20) and decomposition in nature (Chapter 21).

The conclusion from reading the book is that such a wealth of information is brought together, with sufficient literature references for further study, that libraries in different fields of agriculture and botany (physiology, ecology, plant pathology, mycology) should have a copy. Research workers will find much useful information. As the topics are rather diverse, the book can hardly be recommended to students, especially in view of the price.

The editors and the publisher are to be congratulated for the presentation of the book, with hardly any printing errors and with an adequate size of letters, both in the text and in the tables.

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