such as "Bidwill Haloberry" for *Halocarpus bidwillii*. Some of Silba's errors have been repeated by Welch, e.g., omission of the North Island in the distribution of *Halocarpus bidwillii*, but "Tarwood" given as its common name appears to be his own invention.

Some simple guides to identification are provided in Chapter 6 which would assist the reader to identify many conifers to genus, and it includes illustrations which are generally of good quality. The rest of the volume provides a description of each species, a comprehensive coverage of cultivars in the genera from *Abies* to *Phyllocladus*, and an index. Conifers from the Southern Hemisphere barely rate a mention unless they are cultivated in Europe or North America. Lawson cypress (*Chamaecyparis lawsoniana*) and its many cultivars, for example, occupy 31 pages while kauri (*Agathis australis*) is briefly and inaccurately described in eight lines (leaves are alternate or subopposite but never in opposite pairs). A more thorough proof reading would have removed many of the numerous errors detected. Several names are misspelt, for example *Halocarpous bidwilii* (p. 322) for *Halocarpus bidwillii*.

The text contains a number of anthropomorphic and teleological expressions, e.g., "species that ... laughed", "to secure this happy event" (referring to plant reproduction, p. 14), and a plant that "wakes up slowly", which while providing colour are somewhat inappropriate in this type of publication.

Other recent conifer texts such as those by Krussman, Vidakovic, and Rushforth provide more accurate and reliable general guides to conifers and their identification. The value of the "Conifer Manual" lies in its comprehensive coverage of cultivars. It should be of most interest to horticulturalists, nurserymen, and others particularly interested in conifers for amenity purposes.

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ARMILLARIA ROOT DISEASE

Edited by Charles G. Shaw III and Glen Kile

Agriculture Handbook No.691, Forest Service United States Department of Agriculture, Washington, DC., United States. 1991. 233 pages. Available from USDA on request at no charge.

This book is a compendium of the enormous amount of work done on Armillaria root disease over the past century or so. The editors and the authors (24 of them, from three continents) should be congratulated on their achievement in producing this comprehensive work.

There is a major flaw in the work, though, and the blame lies entirely with the editors, who have made a most peculiar decision regarding the use of botanical names. Linnaeus and countless authors since have laboured in vain as far as these two men are concerned. Higher plants are identified by common names, and common names alone, throughout the text, with the botanical names relegated to an appendix (and then not without mistakes—I have not met anyone who calls *Agathis australis* "Queensland kauri"). This custom is regrettably far too

common in the United States; it may well do for strictly local, popular use, but in an international scientific publication such practice is insulting to the reader.

Once one has come to grips with this irritating practice, the many merits of the book become apparent. Watling, Kile & Bursall (Chapter 1) give a detailed exposition of the confused nomenclature in the genus *Armillaria*. They have tabulated 36 species which they believe "to have been documented sufficiently to be considered [as] species"; the list does not include the Australian species *Armillaria fumosa* which was first described by two of the authors of the chapter (Kile & Watling 1983), and *Armillaria griseomellea* (Singer) Kile & Watling is listed as *Armillariella griseomellea* Singer. Colour photographs of 12 species, including *A. fumosa*, are given but unfortunately no scales are provided to allow size comparisons. There is no key to identification of species which perhaps indicates that, even now, sufficient information is not available to allow the construction of a reliable key. Guillaumin, Anderson & Korhonen (Chapter 2) have summarised the scattered information on the sexual system in *Armillaria* and the concept of biological species. This will be most helpful to the non-specialist who finds designations such as NABS VI confusing. It is disappointing to see the five Australian species raised to the rank of "Australasian" species and the endemic New Zealand species, *A. limonea*, altogether ignored.

Garraway, Hütterman & Wargo (Chapter 3) discuss the development of structures such as basidiomes and rhizomorphs and the physiology and nutrition of *Armillaria*. They also cover the physiology of host-parasite interaction. The structure and function of rhizomorphs are particularly well described. Chapter 4 by Redfern & Filip is on inoculum and infection and deals principally with infection caused by rhizomorphs. Factors influencing the growth of rhizomorphs are considered in detail. The next chapter, by Morrison, Williams & Whitney, carries the same theme further and describes the development of infection and its effect on the host. Chapter 6 by Gregory, Rishbeth & Shaw is on the variation in pathogenicity and virulence between and within different species of *Armillaria*. Wargo & Hamilton (Chapter 7) discuss the various factors that predispose the host to disease. Inevitably, there is some repetition in the material presented in these four chapters but it never becomes tedious.

For a forester, the next two chapters are the most informative and useful ones in the book. They give very full details of the occurrence and effect of *Armillaria* throughout the world, in natural forests (Chapter 8—Kile, McDonald & Byler) and in plantations (Chapter 9—Hood, Redfern & Kile). The extensive 10-page table in Chapter 9 which brings together, with references, all records of *Armillaria* on all crop hosts, is particularly impressive. It must have taken an enormous effort to compile.

Chapter 10 by Shaw, Stage & McNamee describes the possible use of the Western Root Disease Model (developed by the USDA Forest Service) for predicting the spread and effect of Armillaria root disease in forest stands. Although the assumptions made in developing the model are valid only for conditions in western North America, this account of how the model was developed would be of interest to other workers in the field. The last chapter (Hagle & Shaw) gives a good account of the various techniques available for the control of Armillaria and provides practical information of use to the practising forester.

In general, this is an excellent compilation of the current knowledge about an important disease of forest trees. It deserves to be read widely by foresters. Forest pathologists will

undoubtedly want to consult it frequently. It is, in fact, essential to make the effort to become familiar with its contents if one is to obtain full benefit from it—the index offers little help. The book is well produced and copiously illustrated. The standard of editing is high and there are very few typographical errors. In these days of high book prices and usurious governments, it is most refreshing to be assured (I have checked with the editors) that this Government publication is available, at no charge, from USDA Forest Service, P.O.Box 96090, Washington, DC. 20090-6090, U.S.A. Hurry while stocks last.

REFERENCE

KILE, G.A.; WATLING, R. 1983: *Armillaria* species from south-eastern Australia. *Transactions of the British Mycological Society 81*: 129–40.

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