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Book review

R. Campbell, 1989. Biological control of microbial plant pathogens. Cambridge University Press, Cambridge/New York/Port Chester/Melbourne/Sydney. X + 218 pp. ISBN 0-521-34088-8 (hard cover), £ 27.50; ISBN 0-521-34900-1 (paperback), £ 9.95.

Campbell has added an attractive book on biological control to the many books on that subject already available these days. He states that he is attempting to serve undergraduate students who are still unfamiliar with the subject. At the same time he hopes that teachers and research workers will profit from his presentation of the subject and from the literature references. However the references are, intentionally, far from complete.

Chapter 1 gives a general introduction to cropping systems, plant pathology and microbial ecology, with some emphasis on the different mechanisms of biological control. In Chapter 2, the history of biological control is outlined, followed by an evaluation of recent interest, and a description of many factors to be kept in mind if one aims at developing a commercial biocontrol agent. Subsequently the principles of biological control are illustrated by examples of research and applications. To this end, the different ecological environments are used for the grouping of the material. Chapter 3 deals with biocontrol on leaf surfaces, Chapter 4 with biocontrol of stem diseases. Chapter 5, biocontrol of diseases of roots, is the longest of the book. Chapter 6 deals with biocontrol of diseases of flowers and fruits and Chapter 7, biocontrol on seeds and seedlings. The last chapter contains conclusions and prospects. It is followed by a short glossary, references by chapter, expanded indexes with more details about specific pathogens and antagonists and the subject index.

The book indeed offers quite a complete description of principles, case stories, problems and prospects for biological control of plant pathogens. I noticed no major aspect missed by this text. This has necessarily placed strong limits on discussion of details and references to literature. Although recognizing the benefits, both for the ease of writing by the author and for reading by the user, the omission of certain references was sometimes a pity. I would have liked to obtain further information about some facts, for instance on suppressiveness of soils to pea wilt (p. 122) or on *Sclerotinia sclerotiorum* on beans (p. 171). For such as those, the book does not provide the entries to literature a researcher would have liked.

Another drawback of its compactness is in the captions of figures and tables, which are sometimes difficult to understand or verging on inaccuracy, and will certainly cause trouble to those unfamiliar with the specific subject (e.g. Figures 1.4, 1.13, 5.6 and 7.1).

In a few instances the book suffers from false compactness, as on p. 69 where powdery and downy mildew are just taken together as mildews. Certainly in a study in which ecology is so predominant, these ecologically contrasting fungi should not be treated as one. Some other clear mistakes are '*Sclerotium trifoliorum*' instead of *Sclerotinia trifoliorum* and the use of tarpaulins or *black* polythene claimed for soil solarization instead of *transparent* polythene (see p. 140, expanded index, p. 170 and glossary). Quite amazingly, an error has slipped into Figure 5.4b, which shows that at least this figure has not been copied directly from the original, but has been redrawn. Those are detailed quibbles on a book for which I have a high regard.

The author shows a definite interest in the application of biocontrol. With his vast knowledge, he is ready to give his judgment on applications and prospects of different approaches. He is certainly not over-optimistic about biological control. Thus it is stated that commercial applications have been most successful up till now with diseases of the stem, and that *Pseudomonas* is the main hope for the future as for biocontrol of soil-borne diseases. However, the consistency of results is a problem with biocontrol in general. 'There seems to be something useful going

on' (p. 135). The effects need not be as big as with chemical control, 'but they must be consistent' (p. 156).

Chapter 2 is quite different from the others. It comprehensively indicates the many factors which should be considered before one can even hope to obtain a biocontrol agent. In fact, in elaborating on a procedure for the development of a biocontrol agent, the author is more rigorous, e.g. on the necessity of full understanding before field tests are planned, than in later chapters, where trial and error are not strictly rejected (p. 159). I wonder why this material was not placed at the end of the book. That would have stressed the prospect of developing biocontrol agents as the result of all research described in the preceding chapters. Paragraph 2.9, the future of biological control, is indeed a crucial one. It shows the ambiguity of discussing biocontrol in the high-tech setting of agriculture in industrialized countries, where overproduction and sustainability are big problems, and nevertheless even integrated control has not yet become generally accepted. The author expects that 'the solution which will be adopted is to keep intensive agriculture to a smaller area, rather than to have systems with a lower input over a larger area'. If this means that biological control will only be an issue for a luxury market in the rich countries and for low-input agriculture in the Third World, as it is nowadays, I can only recommend Campbell's book still more strongly, hoping that it will contribute to a correction of this situation. Its wealth of information, contained in a pleasant book and at a pleasant price, will stimulate students to conceive ideas that will help to increase the range of options for biological control.

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