BOOK REVIEWS

NECHOLS, J. R., L. A. ANDRES, J. W. BEARDSLEY, R. D. GOEDEN, AND C. G. JACKSON (eds). 1995. Biological Control in the Western United States: Accomplishments and Benefits of Regional Research Project W-84, 1964-1989. University of California, Division of Agriculture and Natural Resources; Oakland. xii + 356 p. ISBN 1-879906-21-X. Paperback. (From ANR Publications, 6701 San Pablo Ave, Oakland, CA 94608-1239, $25.00 plus shipping. A hardback edition is available at $45.00).

This book is principally a series of progress reports, representing the research efforts of scientists from 13 states and 2 territories affiliated with the regional research project designated "W-84." Most, but not all, contributors represent Land Grant Universities in the western U.S.; scientists from the U.S. Department of Agriculture, state Departments of Agriculture, and foreign countries are also included in the research effort. The pests are mostly exotic species that became established within the last century, and the emphasis of the biological control research, not surprisingly, is classical biological control. Also included are recommendations for further research on each project.

The first section of the book is devoted to history of the regional project, relationship of biological control to IPM, relationship of biological control to population and evolutionary ecology, and the impacts of biological control. This introductory material provides the theoretical and practical framework for the research reports, and is richly illustrated with examples from the geographic region.

Most of the book consists of case histories of biological control efforts directed toward arthropod pests. The arthropod research reports total 57, and include various mite, thrips, bug, psyllid, whitefly, aphid, scale, mealybug, beetle, caterpillar, and fly projects. Nearly all involve crop pests, with only a few ornamental pests targeted.

In addition to arthropod pests, there are many research reports addressing weed biological control. Most of the weed studies, which total 22, involve rangeland weeds, but a few crop-infesting weeds are included. One-half of the weeds considered are in the family Asteraceae, but the remaining species represent a very diverse group of taxa.

There is no attempt to include biological control of plant pathogens in this compilation; presumably these research efforts function under the auspices of another research project. Microbial organisms are not completely excluded, however, as plant pathogens were introduced for biological control of some weed species, such as rush skeletonweed.

Most of the research reports are very concise but informative. A particular strength is the extensive bibliography accompanying most reports. Overall, the reports make an excellent introduction to ongoing research in biological control in the western United States. Anyone contemplating research on one of these pests would benefit not only from reviewing the research reports, but considering the authors' recommendations for additional research.

A very nice component of the book is summary tables (appendixes 1 & 2) that summarize the classical biological control attempts by biological control agent, target pest, location, and level of success. The book is complete with a comprehensive subject index. The only detracting feature is the inconsistent designation of higher taxa of beneficial arthropods. Some authors note species names only, whereas others include family, and sometimes order, designations. Although it takes additional space to provide this additional information, it makes for a more useful publication.

Biological Control in the Western United States makes a nice companion volume for the report of regional project S-192, *Classical Biological Control in the Southern*

United States (D. H. Habeck, F. D. Bennett, and J. H. Frank, eds., 1990). Both volumes provide updates on progress in biological control, but they take different approaches. The former is organized by taxon, with each report being fairly complete for each pest considered. The latter is more integrative, emphasizing the entire commodity system, and the treatment of each pest is therefore more brief. The former also is a more handsome and durable volume. The title is clearly labeled on the binding, which makes retrieval from a busy bookshelf or cluttered desk more feasible. Unfortunately, with increased quality comes a substantial cost, as the latter sells for a mere $6. *Classical Biological Control in the Southern United States* was reviewed earlier in this journal (74: 167-8; 1991) by D. Rosen.

This book will serve as a handy reference for nearly anyone interested in biological control of arthropods and weeds.

John L. Capinera
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