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Review of *Economic Thresholds for Integrated Pest Management* Edited by Leon G. Higley and Larry P. Pedigo

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Economic Thresholds for Integrated Pest Management. Edited by Leon G. Higley and Larry P. Pedigo. Lincoln: University of Nebraska Press, 1997. xii+327 pp. Tables, figures, references, and index. $55.00 cloth (ISBN 0-8032-2363-3).

If one were asked to pick the one scientific paper having the most influence on pest management, it would be hard to argue with the choice of "The Integrated Control Concept" by Stern, Smith, van den Bosch, and Hagen, published in 1959. This paper is generally regarded as having introduced the idea of economic threshold. The term "Integrated Control" soon gave way to "Integrated Management," emphasizing the notion that pest populations need to be managed in order to avoid unnecessary economic loss. Thus was born Integrated Pest Management (IPM). In the intervening four decades there have been some well-known books published on the subject, both technical and historical. As Higley and Pedigo point out in their introduction to this volume, however, there have been very few symposia or collections of papers, so *Economic Thresholds for Integrated Pest Management* fills an important gap in the literature.

The book is divided into three general sections: Theory, Methods, and New Developments. It also contains an extensive bibliography of over two-hundred related papers. The Theory section clearly defines the relationship between the economic injury level (EIL) and the economic threshold (ET). The EIL "defines how much pest injury (and therefore how many pests) can be tolerated." The ET "is the population density at which control measures should be initiated to prevent an increasing pest population from reaching the EIL." The authors of the papers presented in this section provide a very well-organized and thorough review of both the biological and the mathematical underpinnings of the ET and EIL.

The Methods section contains papers on economic thresholds for weed, plant disease, and insect management. D. A. Mortensen and H. D. Coble point out some of the primary difficulties with developing and applying economic thresholds for weed management by providing several case studies of weed ET implementation. P. A. Backman and J. C. Jacobi present a discussion of thresholds for disease management. Because of the difficulty in directly quantifying disease severity, pathogen management often focuses on climatic and other indices in making treatment decisions. The ET has had the most success in application against insects. G. D. Buntin does a good job with the most difficult assignment: condensing the vast literature on thresholds for insect management into a short, coherent review.

The New Developments section contains six papers. R. K. D. Peterson reviews ET development and points out the relative dearth of conceptual papers. Other papers discuss extensions of the EIL and ET to other domains, including veterinary pests, pests causing cosmetic damage, long-term management for pests of perennial crops, and pests reducing the quality of forage crops. Finally, there is a paper by L. G. Higley and W. K. Wintersteen on the incorporation of environmental and economic damage into the ET.

I was disappointed that this volume neglects to consider statistics and sampling—although some of the authors touch on this topic. Despite this small omission, however, Higley and Pedigo have produced an excellent volume and I recommend it highly to all those interested in bringing themselves up to date on forty years of research on economic thresholds.

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