

BOOK REVIEW

Johnson S.N., Murray P.J. (Eds.) 2008.
Root Feeders – An Ecosystem Perspective.
 CAB International, Wallingford 226 pp.
 ISBN-978-1-84593-461-3

As indicated in the „Foreword“ (p. IX–X) and in the „Acknowledgements“ (p. XI) the contents of this book is mainly based on presentations given at the workshop organized at the University of Reading (UK) titled „Integrative approaches for the investigation root herbivory in agricultural and natural systems“ held in September 2004. However, this book contains also additional later contributions and therefore provides a very comprehensive and actual overview on root–feeding insects.

In „Introduction: Root feeders – an ecosystem perspective“ (p. XIII–XVII) the editors emphasize that the aim of this book is to bring together both agricultural and ecological perspective of root herbivory in order to synthesize what information is currently available on this subject.

Part I. „Techniques for Studying Root Feeders“ (p. 3–32) contains two chapters. In Chapter 1 „Methods for studying root herbivory“ (p. 3–19) L. A. Dawson and R.A. Byers review the major traditional research techniques classified as either „destructive“ or „non-destructive“ laboratory and glasshouse techniques. The authors describe laboratory apparatus, pot-based experiments in controlled environments, pot plant-based experiments in glasshouses and grow bags in protected environments. They also summarize the salient findings of studies that use these techniques to illustrate various parameters. In Chapter 2 „New experimental techniques for studying root herbivores“ (p. 20–23) R.W. Mankin, S.N. Johnson, D.V. Grinev and P.J. Gregory provide a glossary of pertinent terms and characterize techniques of acoustic detectors (p. 22–25) and X-ray tomography (p. 25–32) which allow to investigate the behaviour of plant root-feeding insects in the soil.

Part II. „Root Feeders in Context“ (p. 35–149) contains six chapters covering various topics. In Chapter 3 „Root herbivory in agricultural ecosystems“ (p. 35–53) R.P. Blackshaw and B.R. Kerry characterize three groups of plant pests classified according to how they encounter agricultural crops. The authors discuss biology, ecology and control of two groups of soil pests: leather jackets (*Tipulidae*) and potato cysts nematodes (*Tylenchidae* and *Heteroderidae*). The authors describe biology, ecology and noxiousness of *Tipula paludosa*, *Globodera rostochiensis* and *G. pallida*, as well as use of various control techniques against these pests. In Chapter 4 „Root herbivory in grassland ecosystems“ (p. 54–67) T.R. Seasted and P.J. Murray provide overview of the root-feeding herbivore groups that are most influential in grassland systems in Europe and in North America. The authors indicate that in North America plant nematodes compose the most significant group of herbivores in grasslands and occasionally consume of net primary production (NPP) of plants below ground. The authors emphasize that composition of grasslands is being altered in many areas not

only due to herbivory animals but mainly is being altered as a result of human redistribution of plant species. In Chapter 5 „Root herbivory in forest ecosystems“ (p. 68–95) M.D. Hunter provides interesting information on the architecture of forest tree roots, effects of root herbivores on tree performance and forest dynamics, and methods of measuring root herbivory in forests. In Chapter 6 „Grape *Phylloxera*: an overview“ (p. 96–114) K.S. Powell provides very interesting information on biology, ecology and economic importance of grape phylloxera (*Daktulosphaira vitifoliae*) which is the most economically destructive and geographically widespread pest species of commercial grapevines. Detection and surveillance methods are well described including chemical, spectral and molecular fingerprinting.

In Chapter 7 „Using biocontrol against root-feeding pests, with particular reference to *Sitona* spp. root weevils“ (p. 115–133) S.L. Goldson and P.J. Girard describe theoretical aspects and practical techniques of successful biocontrol of citrus root weevil (*Diapreps abbreviatus*) using entomopathogenic nematodes *Steinernema riobrave* and *Heterorhabditis indica*. Especially broadly is discussed successful biocontrol targeting aboveground of life stages of *Sitona lepidus* and *S. discoideus* in New Zealand using a parasitoid *Microctonus aetiopoides*.

In Chapter 8 „Invasive root feeding insects in natural forest ecosystems of North America“ (p. 134–149) D.R. Coyle, W.J. Mattson and K.F. Raffa provide information on species composition, geographic distribution, host range and impact on forest ecosystems in North America of the four species of invasive root feeding weevils: *Barypeithus pellucidus*, *Phyllobius oblongus*, *Polydrusus sericeus* and *Sciaphilus asperatus*.

Part III „Root Feeders in the Wider Ecosystem“ (p. 153–213) contains three chapters. In Chapter 9 „Linking aboveground and belowground herbivory“ (p. 153–170) S.N. Johnson, T.M. Bezemer and T.H. Jones emphasize that plants are exploited and attacked by a broad range of organisms both above and below soil surface. The authors provide two large and very valuable tables: Table 9.1. „Consequences of shoot-feeding insects in reported plant-mediated interactions with root feeding insects“ (p. 154–157) contains 48 examples; and Table 9.2 „Consequences for root-feeding insects in reported plant-mediated interactions with shoot feeding insects“ (p. 158–159) contains 25 examples. Of special interest to readers will be subchapters referring to impacts of root feeding insects on above ground insect herbivores (p. 160–162) and to impacts of aboveground herbivores on root-feeding insects (p. 163–164).

In chapter 10 „Root feeders in heterogenous systems: foraging responses and trophic interactions“ (p. 171–192) G.. Stevens. K.O. Spencer and E.E. Lewis discuss several interesting examples of multiple effects of entomopathogenic nematodes such as *Steinernema glaseri*, *S. carpocapsae* or *S. riobrave* on herbivore nematodes.

The last chapter 11 titled „Climate change impacts on root herbivores“ (p. 192–213) authored by J.T. Staley and S.N. Johnson will be of great interest for all specialists in plant protection. The authors indicate that there is a general consensus among scientists that the earth’s climate

is rapidly changing. They provide several examples of climate change effects on direct and indirect interactions between root herbivores and aboveground herbivores

Without any question this book requires attention of all ecologists, entomologists and plant protection specialists due to important topic and large amount of references.

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