

BOOK REVIEW

Heaps J.W. (Ed.). 2006. Insect Management for Food Storage and Processing. 2nd Edition. AAAC International, St. Paul U.S.A., 231 pp. ISBN-13: 978-1-891127-46-5; ISBN-10: 1-891127-46-2

This is the second edition of a very comprehensive and useful book first published in 1984. Over the last twenty years there has been a great progress in the knowledge and management technology of stored product pests. For this reason the American Association of Cereal Chemists (AACC) decided to update this book and the editor invited twenty seven specialists from the USA, Israel, Germany and Czech Republic which produced very interesting and useful book on management and control of insects noxious to grain and stored food products.

As pointed in the "Preface (p. I-II) the chapters of this book have been arranged in a specific sequence to help readers "through the thought process that one responsible for food-plant pest management may use".

In chap. 1 "Introduction of the second edition" (p. 1-3) J. W. Heaps provides information on internet websites sources that can greatly assist in identification of stored-product insects. It also explains that sixteen technical chapters have been arranged in five subject parts.

Part I – "Basics of insect pest management" (p. 5-51) contains the seven following chapters.

In chap. 2 "Integrated pest management strategies for food industry" (p. 7-10) D.L. Faustin introduces concept of integrated pest management (IPM) stressing importance of various insect control strategies including insect monitoring devices, sanitation strategy, and packaging design strategy.

In chap. 3 "Role of the pest management professional in food-processing pest management" (p. 11-18) J. Bruesch and L. Mason stress that pest management specialists who wish to serve the food processing and storage industry must be well informed, well equipped, and committed to the IPM ideas.

In chap. 4 "Inspection techniques" (p. 19-23) A.J. StCyr provides many information on regulations issued by FDA and USDA and on practical advices on methods and techniques of inspection of premises as to the presence of noxious insects e.g. *Tribolium confusum*.

In chap. 5 "Facility inspections: supporting insect pests management in the food-manufacturing environment" (p. 23-33) T. Osterberg provides information on tools and facilities which are useful or necessary for inspectors at their inspection tasks.

In chap. 6 "Insect-resistant packing" (p. 35-38) M. A. Mullen and S.V. Mowery emphasize importance of insect-resistant packaging. Of special value are instructions on: (1) package testing for insect resistance, (2) methods to reduce infestation.

In chap. 7 "Stored-product insect behaviour" (p. 39-51) J. F. Campbell discusses implications of insect behavior for pest survey and pest management pointing that understanding insect behavior is critical for successful control of stored-product pests.

Part II "Environmental and nonchemical manipulation" (p. 53-164) contains five chapters that concern methods allowing to achieve not only stored-product insects management but also possible elimination of such pests with right mix of long-term environmental control.

In chap. 8 "Insect light traps" (p. 55-66) J.E. Harris describes principles of operation and use of fluorescent and ultraviolet lamps (=black light lamps) and illustrates the subject with several good photographs and drawings. In a tabulated way a large list of insect species is provided that can be controlled or monitored with light traps. Information on legal regulations, compliance on safety certification, and development of three-phase insect light trap system are provided.

In chap. 9 "Biological control of stored-product pests" (p. 67-87) M. E. Schoeller, P.W. Flinn, M.J. Grieshop and E. Zdarkova discuss broadly present and future use of pathogens, parasites and predators in biocontrol of noxious arthropods in grain storage, mills, bakeries, warehouses and retail stores.

Continued on page 60

Review of book of Heaps J.W. (Ed.) 2006. – continued from page 48

Particularly broadly is discussed potential use of *Trichogramma evanescens* and of predatory mite *Blattisocius tarsalis* in biocontrol of *Ephesthia kuehniella*, *E. ellutella* and *Cadra cautella*. Several interesting remarks as to the future of biocontrol in stored products are provided.

In chap. 10 "Temperature modifications for insect control" O. Dosland, B. Subramanyam, K. Sheppard and R. Mahroof (p. 89–103) clearly demonstrate that higher temperature (heat treatments) is feasible alternative to fumigation against stored-product insects in various food-processing facilities. Heat-treatment case studies are provided for: (1) an in-house heat treatment of a malting facility; and (2) heat treatment of the Kansas State University Pilot Feed Mill.

In chap. 11 "Modified atmosphere for the control of stored-product insects and mites" (p. 105–145) S. Navarro very broadly discuss scientific, technical and economical aspects of using atmosphere modified with CO₂ or N₂ for protection of grain and food product against pests. Especially interesting are author's remarks on research need in this area.

In chap. 12 "Irradiation" (p. 147–152) M. Maricotte discusses irradiation effect on insects and mites, irradiation equipment and irradiation facilities for insect control.

In chap. 13 "Pheromones for stored-product protection" (p. 153–164) D. K. Mueller and A. van Ryckeghem provide several very useful information on commercially available pheromones and traps used for monitoring and trapping of stored-food moths and beetles listed in two tables.

Part III "Chemical control" (p. 165–198) contains four chapters 14, 15, 16 and 17 that concern chemical control and strategies one need's to know when facing the task of eliminating food-plant and warehouse pest infestations.

In chap. 14 "Insect management with residual insecticides" (p. 167–173) F.H. Arthur and P.S. Peckmann discuss application of residual insecticides and factors affecting insecticide performance. They also pointed out that economics and risk factors regarding particular treatment must be considered.

In chap. 15 "Insecticide space treatments of food plants" (p. 175–182) P.S. Peckman and F.H. Arthur characterize dichlorvos, pyrethrins, pyrethroids, insect growth regulators, hydroprene, methoprene and pyriproxyfene at their pest control effectiveness and safety for personnel. The authors also emphasized that treatments should be applied selectively and with discretion.

In chap. 16 "Commodity and space fumigations in the food industry" (p. 183–198) V. Walter points out that fumigation is the most effective method of pest control but must be considered as the last choice for control when nothing else has worked out. Positive and negative aspects of five broadly used fumigants such as methyl bromide, sulfuryl fluoride, phosphine, carbonyl sulfide and ethyl format are provided in a tabulated form. A good outlook on future trends in fumigation of various commodities is provided.

Party IV "Safety and environmental health" (p. 199–222) has only one chap. 17 titled "Insecticides and occupational health in the food industry" (p. 201–207) in which G. W. Olmstead in a descriptive way and in four tables provide useful information on first aid treatment for insecticide poisoning and health standards for various chemical insecticides established by Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA).

Part V "Summary" (p. 209–222) contains only one chap. 16 "The science and technology of post-harvest insect control: challenges, accomplishments, and future directions" (p. 211–222). In this chapter T.W. Phillips provides an excellent outlook on research accomplishments and prospects in such areas as: biology of cells and molecules of stored product insects; biological and bio-rational control; monitoring, sampling, and predicting pests; implementing IPM systems.

I strongly recommend this excellent treatise to the attention of specialists working on stored products protection and to all agricultural libraries.

Jerzy J. Lipa

Institute of Plant Protection, Miczurina 20, 60-318 Poznań, Poland