

# Agricultural Insect Pests and their Control



2nd Revised Edition

**V.B. Awasthi**



# AGRICULTURAL INSECT PESTS AND THEIR CONTROL

Second Revised and Enlarged Edition

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## **PREFACE**

### **(2<sup>nd</sup> Edition)**

I would like to thank both the teachers and the students of entomology for accepting whole heartedly the first edition of Agricultural Insect Pests and Their Control. In this, second edition, three new chapters viz., (1) Ecological tactics for management of insect pests, (2) Molecular techniques and habitat manipulation for parasitoid conservation in cropping systems and (3) Pests of Spices, Narcotics and Drugs have been added. Also at appropriate places in the text some minor corrections/alterations have been made. A large number of new illustrations have been reproduced along with original sources which were not available at the time of first edition. The selected bibliography has been updated. I hope the readers of agricultural entomology will find this edition of book more useful.

**Jodhpur**

**Dr. V.B. AWASTHI**

## **PREFACE**

### **(1<sup>st</sup> Edition)**

This book has been written keeping in view the requirements of the students of Agricultural Entomology of various Indian Universities. The book provides a brief account on the structure, function, development and metamorphosis and a comprehensive account on almost all the methods of pest control (viz.: cultural control, physical and mechanical control, biological control including genetic sterile male methods, insect hormones as pesticides; plant quarantine and legal control, chemical control and integrated pest management). The various appliances used in the pest management have also been given. The nature of damage caused by the major insect pests of crops, their life histories and control that have been described are: Polyphagous pests, pests of cotton and fibre crops, pests of sugarcane, pests of oilseed crops, pests of pulse crops, pests of sorghum, pests of cereal crops, pests of fruits and fruit trees, pests of vegetables, pests of plantation crops, pests of soybean, insect and some other pests of floricultural crops and pests of stored grains.

Further, so far published books on Applied or Agricultural Entomology provide no information on the insect pests of soybean which has been considered as a "wonder crop" in India. Because it incorporates the qualities of pulses, oilseeds and vegetables and thus meeting important basic requirements of oil, protein and vegetables needed by man.

Some minor pests have also been described because at times, when the climatic conditions are favourable, their food habit changes and they may become injurious to several crops. It is interesting to note that the population dynamics and the outbreak of the insects in the pest form are directly influenced by (1) temperature, (2) humidity, (3) food, and (4) shelter in addition to several other factors which also control the survival and dispersal of pest species, in a particular area. This is very common in oligophagous and polyphagous insects.

Further, I would like to mention here that several chlorinated hydro-carbon insecticides like DDT, BHC aldrin, dieldrin etc, used in the past have recently been banned. In the control of pests, only those insecticides have been given that described in authentic books.

In the book, only from historical point of view, account of some of the chlorinated hydrocarbon-insecticides has been given under the footnote

"banned". Likewise, several organophosphorus compounds, systemic insecticides and fumigants are also not in use in pest control now a days.

It is hoped that the students of Entomology of Agricultural Universities and Colleges will find the book extremely useful. The book will also be useful to the Plant Protection Departments and similar Institutions. A large number of figures have also been given to facilitate easy identification of the insect pests. In the appendixes the common names and trade names of some insecticides, as well as characteristics of insect orders and their agricultural importance have been given. Every attempt has been made to provide all the necessary information that is needed by the students of Agricultural Entomology and here I would like to cite Robert E. Pfadt (1962):

*"As one may surmise from what has been said, text books are not the best places for anyone to seek the latest in insect control recommendations. On the other hand, texts do serve an important role in providing both a background of information on insects, their habits, life histories, and ecology and an appreciation of the insect problems on various crops and how we go about solving these problems."*

In the course of compilation of the text material several books, journals, technical bulletins, research papers and review articles have been consulted. I express my sincere thanks to the authors, publishers, reviewers and scientists whose work form the base of the book.

I am thankful to my friend Dr. Allah Noor Khan, Associate Professor of Agricultural Entomology, A.R.S. Mandore, Jodhpur for going through the manuscript and offering valuable suggestions.

I am grateful to the authorities of Scientific Publishers (India), Jodhpur, Shri Prahlad Rai Sharma and Shri Pawan Kumar Sharma for their keen interest in my work and publishing the book nicely.

I am also extremely thankful to my wife Sneh Lata and son Dr. Santosh Kumar for their constant encouragement and whole hearted support.

I am particularly grateful to my daughter Shubha, for reading the proof and suggesting necessary corrections.

I would appreciate if readers of the book will inform me of any errors or omissions that may come to their notice.

**Jodhpur**

**27th March, 2007**

**Dr. V.B. AWASTHI**

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