

Biointensive Integrated Pest Management in Horticultural Ecosystems

P. Parvatha Reddy



BIOINTENSIVE INTEGRATED PEST MANAGEMENT IN HORTICULTURAL ECOSYSTEMS

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PREFACE

Through ‘Green Revolution’ in late 1960’s, India achieved self sufficiency in food production, which was hailed as a breakthrough on the farm front by international agricultural experts. But still the country has not achieved self sufficiency in production of horticultural crops. Most of the growth in food production during the green revolution period is attributed to the use of improved crop varieties and higher levels of inputs of fertilizers and pesticides. The modern agricultural techniques such as use of synthetic fertilizers and pesticides are continuing to destroy stable traditional ecosystems and the use of high yielding varieties of crops has resulted in the elimination of thousands of traditional varieties with the concurrent loss of genetic resources. The introduction of high yielding varieties changed the agricultural environment leading to numerous pest problems of economic importance. In the process of intensive farming, the environment has been treated in an unfriendly manner.

Prof. Swaminathan (2000) emphasized the need for ‘Ever Green Revolution’ keeping in view the increase in population. The increase in population and diminishing per capita availability of land demands rise in productivity per unit area. In India, annual crop losses due to pests, diseases and weeds have been estimated to be about Rs. 600,000 million in 2005. Increasing yields from existing land requires effective crop protection to prevent losses before and after harvest. The challenge before the crop protection scientist is to do this without harming the environment and resource base. This can be achieved by adopting eco-friendly Biointensive Integrated Pest Management (BIPM) strategy.

BIPM is defined as “A systems approach to pest management based on an understanding of pest ecology. It begins with steps to accurately diagnose the nature and source of pest problems, and then relies on a range of preventive tactics and biological controls to keep pest populations within acceptable limits. Reduced-risk pesticides are used if other tactics have not been adequately effective, as a last resort, and with care to minimize risks” (Benbrook, 1996).

BIPM incorporates ecological and economic factors into agricultural system design and decision making, and addresses public concerns about environmental quality and food safety. The benefits of implementing BIPM can include reduced chemical input costs, reduced on-farm and off-farm environmental impacts, and more effective and sustainable pest management. An ecology-based IPM has the potential of decreasing inputs of fuel, machinery, and synthetic chemicals-all of which are

energy intensive and increasingly costly in terms of financial and environmental impact. Such reductions will benefit the grower and society.

The information on biointensive integrated pest management (insect, mite and nematode pests, and diseases caused by bacteria, fungi, virus/mycoplasma) in horticultural ecosystems (fruits, vegetables, ornamentals, medicinal, aromatic, tuber, plantation and spice crops) is very much scattered. There is no book at present which comprehensively and exclusively deals with the above aspects. The present book deals with the most recent biointensive integrated approaches utilizing components such as bioagents [predators, parasitoids and pathogens (bacteria, fungi, viruses)], botanicals (biofumigation, oil cakes, FYM, compost, crop residues, green manuring and other organic amendments), endomycorrhizae, physical methods (hot water treatment of planting material, soil solarization), cultural methods (crop rotation, summer ploughing, fallowing, intercropping, pruning, mulching, spacing, planting date, trap cropping, *etc.*), biorational chemicals (pheromones) and resistant cultivars. The book is illustrated with excellent quality photographs enhancing the quality of publication. The book is written in lucid style, easy to understand language along with adoptable recommendations for pest management.

This book can serve as a useful reference to policy makers, research and extension workers, practicing farmers and students. The material can also be used for teaching post-graduate courses. Suggestions to improve the contents of the book are most welcome (E-mail: reddy_parvatha@yahoo.com). The Publisher, Scientific Publishers (India), Jodhpur, deserves commendation for their professional contribution.

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CONTENTS

Section I INTRODUCTION

1. Introduction	1
1.1. Integrated Pest Management (IPM)	1
1.2. Biointensive Integrated Pest Management (BIPM)	2

Section II FRUIT CROPS

2. Tropical Fruit Crops	27
2.1. Banana	27
2.2. Citrus	35
2.3. Sapota	48
2.4. Papaya	48
2.5. Jackfruit	52
2.6. Strawberry	53
2.7. Mulberry	57
3. Sub-tropical Fruit Crops	60
3.1. Mango	60
3.2. Grapevine	62
4. Temperate Fruit Crops	66
4.1. Apple	66
4.2. Peach and Plum	75
4.3. Pear	77
5. Semi-arid Fruit Crops	80
5.1. Pomegranate	80

Section III VEGETABLE CROPS

6. Solanaceous Vegetable Crops	85
6.1. Potato	85
6.2. Tomato	93

6.3. Brinjal	121
6.4. Chilli and Bell Pepper	139
7. Bulbous Vegetable Crops	159
7.1. Onion and Garlic	159
8. Cruciferous Vegetable Crops	163
8.1. Cabbage and Cauliflower	163
9. Malvaceous Vegetable Crops	170
9.1. Okra	170
10. Root Vegetable Crops	181
10.1. Carrot	181
10.2. Radish	183
10.3. Beet Root	184
11. Leguminous Vegetable Crops	185
11.1. Pea	185
11.2. French Bean	188
11.3. Cowpea	189
11.4. Pigeon Pea	191
11.5. Cluster Bean	201
11.6. Field Bean	201
12. Cucurbitaceous Vegetable Crops	203
12.1. Pumpkin	203
12.2. Cucumber	205
12.3. Watermelon	209
12.4. Muskmelon	210
12.5. Bitter Gourd	212
12.6. Pointed Gourd	214
13. Leafy Vegetable Crops	217
13.1. Lettuce	217
13.2. Asparagus	219
13.3. Drumstick	220
Section IV	
ORNAMENTAL, MEDICINAL, AROMATIC AND TUBER CROPS	
14. Ornamental Crops	225
14.1. Rose	225
14.2. Carnation	227
14.3. Gerbera	231

14.4. Tuberose	232
14.5. Gladiolus	238
14.6. Chrysanthemum	240
14.7. Crossandra	240
15. Medicinal Plants	245
15.1. Coleus	245
15.2. Aswagandha	253
15.3. Sarpagandha	257
15.4. Henbane	257
15.5. Aloe	258
15.6. Babchi	259
15.7. Soda apple	259
16. Aromatic Crops	260
16.1. Jasmine	260
16.2. Mint	261
16.3. Patchouli	263
16.4. Chamomile	264
16.5. Davana	265
17. Tuber Crops	266
17.1. Sweet Potato	266
17.2. Colocasia	267
17.3. Elephant Foot Yam	268
Section V	
PLANTATION AND SPICE CROPS	
18. Plantation Crops	271
18.1. Coffee	271
18.2. Tea	272
18.3. Coconut	279
18.4. Areca Nut	283
18.5. Betel Vine	284
18.6. Cocoa	286
18.7. Rubber	287
19. Spice Crops	288
19.1. Black Pepper	288
19.2. Cardamom	295
19.3. Ginger	299
19.4. Turmeric	306

19.5. Vanilla	307
19.6. Fenugreek	309
19.7 Cumin	310
Section VI	
TRANSFER OF CROP PROTECTION TECHNOLOGY AND CONCLUSIONS	
20. Transfer of Crop Protection Technology and Conclusions	315
20.1. Transfer of Crop Protection Technology	315
20.2. Conclusions	323
REFERENCES	324
SUBJECT INDEX	357

Section I

INTRODUCTION

