

# Contents

Foreword

Preface

## CROP LOSS ASSESSMENT: BACKGROUND, RATIONALE, AND CONCEPTS

---

Crop loss assessment: a historical perspective and rationale 1

*J.C. Zadoks*

Crop loss and pest and pesticide management 11

*D.G. Bottrell*

Crop loss assessment: a review of representative approaches  
and current technology 19

*P.S. Teng*

Current knowledge on crop losses in tropical rice 39

*P.S. Teng; C.Q. Torres, F.L. Nuque, and S.B. Calvero*

## COMPONENT TECHNOLOGY FOR CROP LOSS ASSESSMENT

---

Quantifying insect populations and crop damage 55

*P.T. Walker*

Practical methods for quantifying diseases and pathogen populations 67

*R.E. Gaunt*

Weeds: generating populations, field sampling, and data analysis 75

*K. Moody*

Monitoring the physical environment for yield loss studies 87

*S.M. Coakley*

Remote sensing and image analysis for crop loss assessment 93

*F.W. Nutter, Jr.*

Sampling insects and diseases in rice 107

*B.M. Shepard and E.R. Ferrer*

Empirical models for predicting yield loss caused by stem borers 131

*P.T. Walker*

- Generating plant disease epidemics in yield loss experiments **139**  
*F.W.Nutter, Jr.*
- Determining pest-loss relationships and quantifying loss **151**  
*P.T.Walker*
- Using yield physiology to model pest losses **161**  
*R.E.Gaunt*
- Insect pest-loss relationships: characteristics and importance **171**  
*P.T.Walker*
- Empirical disease-yield loss models **185**  
*R.E.Gaunt*
- Yield losses due to weeds in rice in the Philippines **193**  
*K.Moody*
- Assessing multiple pest populations and their effects on crop yield **203**  
*K.B.Johnson*

#### APPLICATIONS OF PEST AND LOSS ASSESSMENT TECHNOLOGY TO PEST MANAGEMENT

---

- Systems analysis and modeling in pest management **215**  
*K.L.Heong*
- A multiple-pest economic threshold for rice (a case study in the Philippines) **229**  
*F.Palis, P.L.Pingali, and J.A.Litsinger*
- Methodology used in the IRRI integrated pest survey **243**  
*F.A.Elazegui, J.Soriano, J.Bandong, L.Estorninos,  
I.Johnson, P.S.Teng, B.M.Shepard, J.A.Litsinger,  
K.Moody, and H.Hibino*
- Information management systems in rice pest surveillance **273**  
*K.L.Heong*
- EIPRE: research - development - application of an integrated pest  
and disease management system for wheat **281**  
*J.C.Zadoks*
- Using pest surveillance data in Thailand **291**  
*P.Menakanit, A.Upanisakorn, L.Menakanit,  
S.Sriarunothai, and U.Dechmani*
- Genetically sound strategies for disease management **297**  
*K.M.Chin*
- Using historical weather and pest data for pest zoning **303**  
*S.M.Coakley*
- Requirements for an economic interpretation of crop losses **313**  
*H.Waibel*
- Recommendations **321**
- Participants **328**