

Contents

| Pre Co | eface blour plates I to IV | between pages 64 and | v 65 b |
|-----------|--|--|-------------------|
| 1. | Plant Pathology: An | Insight | 1 |
| | Concept History of plant patholog Plant pathology in a nut Linkage with other scien | gy shell ces | 1 1 2 10 |
| 2. | Terms Used in Plant | Pathology | 19 |
| | Primary and Secondary | inoculums | 19 |
| 3. | Plant Diseases | | 24 |
| | Classification of plant d | sease | 26 |
| 4. | Importance of Plan | t Diseases | 33 |
| | Damage and loss Epidemics and human | affairs | 33 33 |
| 5. | Inanimate Causes | of Plant Diseases | 40 |
| | Causes of plant disease Soil conditions Meteorological condition Agricultural practices—r chemical injuries by f | ess ons mechanical and ungicides, insecticides, | 40 41 45 |
| | and herbicides Industrial by-products— smog, smoke, gases, | smelter and other fumes, and dust from | 50 |
| | cement plants | or poolally in transit | 51 |
| | and storage | | 53 |
| 6. | Animate causes of | Plant Diseases | 54 |
| | Animals Plants Viruses | | 55 58 72 |
| 7. | Symptoms Associat Plant Diseases | ed with | 76 |
| | Diagnosis/identification | of plant diseases | 82 |

| 8. | Dissemination and Dispersal of Plant Pathogens | 86 |
|-----|--|---|
| | Direct Indirect | 86 88 |
| 9. | Pathogenesis | 94 |
| | Steps in disease development Parasitism and pathogenicity The infection chain Inoculation The recognition Penetration related activities Host-pathogen interface Infection and further developments Recurrence of plant diseases Survival Longevity and survivability Modes of survival | 94 95 97 98 99 99 102 104 105 105 105 |
| 10. | The Defensive Host | 113 |
| | Philosophy of defence in plants Pathogenesis and host response Defence mechanisms: pre-existing or passive Defence mechanism: induced or active Induced biochemical changes Pathogenesis-related proteins Active defence to pathogens | 113 113 114 118 123 124 127 |
| 11. | The Offensive Pathogen | 133 |
| | Enzymes Toxins in disease development Other host-specific toxins | 134 137 141 |
| 12. | Pathogen Induced Changes in the Host | 145 |
| | Changes at physiological level Changes at biochemical Level | 145 151 |
| 13. | Effect of Environment on Disease Development | 154 |
| | Temperature Moisture Wind | 155 157 158 |

Basic Plant Pathology

| | Light Oxygen and carbon dioxide concentration Soil ph Host plant nutrition Air pollutants Herbicides | 158 158 159 159 161 161 |
|-----|--|---|
| 14. | Genetics of Host—Parasite Interaction and Molecular Basis | 162 |
| | Genes and plant disease Genetics of resistance Polygenic or horizontal resistance Genetics of pathogenecity Recognition mechanism in host-pathogen interaction | 164 165 174 177 185 |
| 15. | Epidemiology of Plant Diseases | 194 |
| | Epidemic and its element Pathogen factor Host factor Environmental factors Human cultural practices and control measures The nature of epidemics in crop plants Population dynamics Disease-loss assessment Modelling of epidemics Theoretical basis of epidemiology Impact of latent and incubation periods | 194 195 195 197 197 197 198 200 203 204 |
| | Impact of plant growth and senescence | 204 205 |
| 16. | Impact of plant growth and senescence Measurement of Plant Diseases | 204 205 206 |
| 16. | Impact of plant growth and senescence Measurement of Plant Diseases Objectives of disease measurement Disease parameters Disease incidence Disease severity Disease index The economic threshold Crop yield losses: the concept Application of threshold concept Methods for disease assessment Descriptive keys Standard area diagrams Growth stage keys Inoculum-disease relationship Models for crop yield loss estimation Monitoring of plant diseases Survey and surveillance | 204 205 206 207 207 207 208 208 209 210 212 212 213 213 213 213 214 216 216 |
| 16. | Impact of plant growth and senescence Measurement of Plant Diseases Objectives of disease measurement Disease parameters Disease incidence Disease incidence Disease incidence Disease severity Disease index The economic threshold Crop yield losses: the concept Application of threshold concept Methods for disease assessment Descriptive keys Standard area diagrams Growth stage keys Inoculum-disease relationship Models for crop yield loss estimation Monitoring of plant diseases Survey and surveillance | 204 205 206 207 207 207 208 208 209 210 212 212 213 213 213 213 214 216 216 217 |
| 16. | Impact of plant growth and senescence Measurement of Plant Diseases Objectives of disease measurement Disease parameters Disease incidence Disease severity Disease index The economic threshold Crop yield losses: the concept Application of threshold concept Methods for disease assessment Descriptive keys Standard area diagrams Growth stage keys Inoculum-disease relationship Models for crop yield loss estimation Monitoring of plant diseases Survey and surveillance Forecasting of Plant Diseases Pre-requisites for developing a forecast system Disease forecasting systems Criterion used for disease forecasting Forecast based on weather conditions | 204 205 206 207 207 207 208 208 209 210 212 212 213 213 213 213 214 216 216 217 217 218 218 |

| | Forecast based on weather conditions during c season Blitecast and after Long-term vs short-term forecast Remote sensing and its applications Plant disease warning services | rop 220 221 223 226 226 |
|---|---|--|
| 18. | Management of Plant Diseases | 230 |
| | Management versus control | 230 |
| | Principles of disease management | 231 |
| 19. | Regulatory Methods | 234 |
| | Brief history | 236 |
| | International organizations Plant augraphine in India | 237 |
| | Guidelines for import of germ plasm | 238 |
| | Problems in plant quarantine | 239 |
| | Some important quarantine | 239 |
| 20. | Physical Methods | 241 |
| | Disease control | 241 |
| | Disease control by trench barriers | 248 |
| 21. | Cultural Practices | 249 |
| | Sanitation | 249 |
| | material | 251 |
| | | |
| | Adjustment of crop culture to minimize disease | 252 |
| 22. | Adjustment of crop culture to minimize disease Biological Control | 252 264 |
| 22. | Adjustment of crop culture to minimize disease Biological Control Theories | 252 264 266 |
| 22. | Adjustment of crop culture to minimize disease Biological Control Theories Mechanisms, tactics and process | 252 264 266 267 |
| 22. | Adjustment of crop culture to minimize disease Biological Control Theories Mechanisms, tactics and process Some examples of biological control Biological condition | 252 264 266 267 271 276 |
| 22. | Adjustment of crop culture to minimize disease Biological Control Theories Mechanisms, tactics and process Some examples of biological control Biological seed treatment Modification of soil environment | 252 264 266 267 271 276 277 |
| 22. | Adjustment of crop culture to minimize disease Biological Control Theories Mechanisms, tactics and process Some examples of biological control Biological seed treatment Modification of soil environment Biological control of insects (bioinsecticides) Biological control of nematodes | 252 264 266 267 271 276 277 278 |
| 22. | Adjustment of crop culture to minimize disease Biological Control Theories Mechanisms, tactics and process Some examples of biological control Biological seed treatment Modification of soil environment Biological control of insects (bioinsecticides) Biological control of nematodes (bionematicides) | 252 264 266 267 271 276 277 278 282 |
| 22. | Adjustment of crop culture to minimize disease Biological Control Theories Mechanisms, tactics and process Some examples of biological control Biological seed treatment Modification of soil environment Biological control of insects (bioinsecticides) Biological control of nematodes (bionematicides) Control strategies | 252 264 266 267 271 276 277 278 282 284 |
| 22. | Adjustment of crop culture to minimize disease Biological Control Theories Mechanisms, tactics and process Some examples of biological control Biological seed treatment Modification of soil environment Biological control of insects (bioinsecticides) Biological control of nematodes (bionematicides) Control strategies Biological control of weeds (bioherbicides) | 252 264 266 267 271 276 277 278 282 284 284 285 |
| 22. | Adjustment of crop culture to minimize disease Biological Control Theories Mechanisms, tactics and process Some examples of biological control Biological seed treatment Modification of soil environment Biological control of insects (bioinsecticides) Biological control of nematodes (bionematicides) Control strategies Biological control of weeds (bioherbicides) Chemical Control | 252 264 267 271 276 277 278 282 284 285 288 |
| 22. 23. | Adjustment of crop culture to minimize disease Biological Control Theories Mechanisms, tactics and process Some examples of biological control Biological seed treatment Modification of soil environment Biological control of insects (bioinsecticides) Biological control of nematodes (bionematicides) Control strategies Biological control of weeds (bioherbicides) Chemical Control Formulations and applications | 252 264 266 267 271 276 277 278 282 284 285 288 289 |
| 22. 23. | Adjustment of crop culture to minimize disease Biological Control Theories Mechanisms, tactics and process Some examples of biological control Biological seed treatment Modification of soil environment Biological control of insects (bioinsecticides) Biological control of nematodes (bionematicides) Control strategies Biological control of weeds (bioherbicides) Chemical Control Formulations and applications Systemicity Classification of fungicides | 252 264 266 267 271 276 277 278 282 284 285 288 289 292 293 |
| 22. 23. 24. | Adjustment of crop culture to minimize disease Biological Control Theories Mechanisms, tactics and process Some examples of biological control Biological seed treatment Modification of soil environment Biological control of insects (bioinsecticides) Biological control of nematodes (bionematicides) Control strategies Biological control of weeds (bioherbicides) Chemical Control Formulations and applications Systemicity Classification of fungicides Host Immunization | 252 264 266 267 271 276 277 278 282 284 285 288 289 292 293 308 |
| 22. 23. 24. | Adjustment of crop culture to minimize disease Biological Control Theories Mechanisms, tactics and process Some examples of biological control Biological seed treatment Modification of soil environment Biological control of insects (bioinsecticides) Biological control of nematodes (bionematicides) Control strategies Biological control of weeds (bioherbicides) Chemical Control Formulations and applications Systemicity Classification of fungicides Host Immunization Immunization | 252 264 266 267 271 278 282 284 285 288 289 292 293 308 308 |
| 22.23.24.25. | Adjustment of crop culture to minimize disease Biological Control Theories Mechanisms, tactics and process Some examples of biological control Biological seed treatment Modification of soil environment Biological control of insects (bioinsecticides) Biological control of nematodes (bionematicides) Control strategies Biological control of weeds (bioherbicides) Chemical Control Formulations and applications Systemicity Classification of fungicides Host Immunization Immunization Integrated Disease Management | 252 264 267 271 276 277 278 282 284 285 288 289 292 293 308 308 308 |
| 22.23.24.25. | Adjustment of crop culture to minimize disease Biological Control Theories Mechanisms, tactics and process Some examples of biological control Biological seed treatment Modification of soil environment Biological control of insects (bioinsecticides) Biological control of nematodes (bionematicides) Control strategies Biological control of weeds (bioherbicides) Chemical Control Formulations and applications Systemicity Classification of fungicides Host Immunization Immunization Integrated Disease Management Some examples of IPM/IDM | 252 264 266 267 271 278 282 284 285 288 289 292 293 308 308 308 323 324 |
| 22.23.24.25. | Adjustment of crop culture to minimize disease Biological Control Theories Mechanisms, tactics and process Some examples of biological control Biological seed treatment Modification of soil environment Biological control of insects (bioinsecticides) Biological control of nematodes (bionematicides) Control strategies Biological control of weeds (bioherbicides) Chemical Control Formulations and applications Systemicity Classification of fungicides Host Immunization Immunization Integrated Disease Management Some examples of IPM/IDM | 252 264 266 277 278 282 284 285 288 289 292 293 308 308 308 323 324 |

viii