

## CONTENT

	Page
List of Contributors	v
Preface	vii
Contents of Volume II	xv
Chapter 1 HISTORY OF FUNGICIDES	
I Introduction	1
II The First or Sulfur Era (to 1882)	2
III The Second or Copper Era (1882-1934)	6
IV The Third or Organic Fungicide Era (1934-)	12
V Conclusion	28
References	29
Chapter 2 WORLD FUNGICIDE USAGE	
I Introduction	39
II Major Diseases on Major Crops	45
III Noncrop Uses of Fungicides	54
IV Trends in Fungicide Usage	55
References	60
Chapter 3 EPIDEMIOLOGY OF FUNGICIDAL ACTION	
I Introduction	63
II Relation between the Amount of Inoculum and the Amount of Disease It Produces	65
III The Progress of an Epidemic and the Effect of Fungicides on It	77
IV The Fungicide Square : Pathogen, Host, Environment, and Fungicide	89
References	91
Chapter 4 DETERMINATION AND MEASUREMENT OF FUNGITOXICITY	
I Introduction	93
II Basic Fungitoxicity Tests	94
III Practical Fungitoxicity Tests	99
IV Assessment of Results	110
V Correlation among Basic, Practical, and Field Test Results	112
References	113
Chapter 5 COMMERCIAL FUNGICIDE DEVELOPMENT	
I Starting the Search	126
II Some Factors to Study	130
III Development Costs	138
IV Fungicides and the Law	143
V Coordination with Government Research	148
VI The Need to Succeed	149
References	151
Chapter 6 FORMULATION	
I Introduction	153
II Types of Formulation	155
III Compatibility	160
IV Evaluation of Physical Properties of Formulations	162
V Effect of Formulation on Fungicide Performance	167
VI Conclusions	182
References	183

Chapter 7	APPLICATION AND USE OF SOIL AND SEED-TREATMENT FUNGICIDES	
I	Introduction	195
II	Soil Treatment	197
III	Seed Treatment	214
	References	231
Chapter 8	APPLICATION AND USE OF FOLIAR FUNGICIDES	
I	Introduction	240
II	Methods of Applications	249
III	Production of Small Particles	252
IV	Movement toward the Target	257
V	Deposition on the Target	266
VI	Distribution on the Target	270
VII	Spray Cover	274
VIII	Persistence and Redistribution	276
IX	Transfer of the Fungicide	280
X	Conclusions	284
	References	284
Chapter 9	APPLICATION AND USE OF POSTHARVEST FUNGICIDES	
I	Introduction	288
II	Etiology of Postharvest Diseases in Relation to Control	289
III	Objectives of postharvest Fungicide Treatment	292
IV	Biological and Environmental Factors Influencing the Effectiveness of the Treatment	301
V	Methods of Applying Postharvest Fungicide Treatments	307
VI	Properties and Applications of Specific Fungicides	317
VII	Current and Future Trends in the Development of Postharvest Fungicides	359
	References	361
Chapter 10	APPLICATION AND USE OF FUNGICIDES AS INDUSTRIAL PRESSERVATIVES	
I	Introduction	379
II	Textiles	380
III	Paper and Pulp	391
IV	Rubber, Plastics, and Paint	395
V	Electrical and Electronic Equipment	402
VI	Petroleum Products	404
VII	Leather	410
VIII	Drug and Cosmetic Preservatives	413
	References	416
Chapter 11	APPLICATION AND USE OF FUNGICIDES IN WOOD PRESERVATION	
I	Introduction	425
II	Present Status of the Wood Preserving Industry	427
III	Characteristics of Wood-Attacking Fungi	430
IV	The Prevention of Decay without the Use of Fungicides	432
V	Requirements of Wood Preservatives and General Types Used	434
VI	Oil-Type Preservatives	436
VII	Waterborne Preservatives	441
VIII	Relation between chemical Constitution and Toxicity to Wood-Destroying Fungi	445
IX	The Effectiveness of Wood Preservatives	450
X	Conventional Retentions of Wood Preservatives	453
XI	Methods of Applying Preservatives	454
	References	458
Chapter 12	CHEMICAL AND PHYSICAL INTERACTIONS	
I	Introduction	463
II	The Actors	464
III	The Interactions	478
	References	505

Chapter 13	FUNGICIDES IN THE SOIL ENVIRONMENT	
I	Introduction	510
II	The Fate of Fungicides in Soil	512
III	Factors Affecting Fungicidal Efficiency	522
IV	Specific Details Regarding Commercially Used Fungicides	532
V	Future of Soil Fungicides and Research	545
VI	Summary	550
	References	550
Chapter 14	UPTAKE, TRANSLOCATION, AND TRANSFORMATIONS BY HIGHER PLANTS	
I	Introduction	561
II	Uptake and Movement of Chemicals	565
III	Factors Affecting Uptake and Translocation	587
IV	Transformations of Fungicides within Plants	591
	References	597
Chapter 15	MICROBIOLOGICAL DETOXICATION AND OTHER TRANSFORMATIONS	
I	Introduction	613
II	Bacterial Degradations	614
III	Fungal Degradations	624
IV	Toxicant Inactivation by Metabolites	632
	References	637
	Author Index	643
	Subject Index	667