

## CONTENT

	Page
Preface	iii
Introduction	1
Part I : The Composition and Contents of the Soil	
1. The Origin and Formation of Fertile Soil	9
2. The Mineral Soil Constituents	12
3. The Organic Contents of the Soil	25
4. Soil Microorganisms and Other Soil Inhabitants	47
Part II : The Physical Condition of the Soil Contents and Their Properties as Related to Plants	
Introduction	64
5. The Solid Soil Particles	65
6. The Properties of Mineral Soil Colloids	70
7. The Liquid Soil constituents (The Soil solution)	81
8. The Gaseous Soil Constituents ( The Soil Atmosphere)	97
9. Photosynthesis	100
10. Acidity and Alkalinity of the soil	104
11. Soil Aggregation	118
12. Soils of Special Character	125
Part III : Soil Dynamics – The Interacting Forces within The Soil (The Living Soil)	
13. Historical Introduction	135
14. The Dynamic Soil Processes	145
15. The Buffering Action of Soil	171
16. Soil Profiles and Soil Classification	180
17. Crop Rotation	188
Part IV : The Main Nutrient Elements, Their Origin and Their Behavior in the Soil	
Introduction	192
18. The Story of Nitrogen	193
19. The Story of Phosphorus	206
20. The Story of Potassium	213
21. The Story of Calcium	219
22. The Story of Sulfur	228
23. The Story of Iron	236
24. The Story of Carbon	240
25. The Availability of Soil Substances to Plants	244
Part V : Manures, Composts, and Fertilizers	
Introduction	252
26. The Organic Fertilizer Materials	255
27. Inorganic or Mineral Fertilizer Materials	294
28. Mixed Fertilizers	323
29. Liquid Fertilizers	325
30. The Residual Effect of Fertilizers on Soil Reaction	328
31. Important Data on Fertilizer Materials	335
32. The Compatibility of Fertilizer Materials	341

	Part V : The Laws of Soil Fertility	
	Introduction	344
33.	The Fundamental Concepts on Which the Laws of Soil Fertility Are Based	349
34.	The Development and Formulation of the Laws of Soil Fertility	355
35.	Interpretation of the Amounts Determined by Soil Analysis	361
36.	Water as a Growth Factor	367
37.	The Depth of the cultivated Soil as a Growth Factor	371
38.	The Soil-Fertility Index	375
39.	The Ideal Soil Nutrient Balance and the Correction of an Unbalanced Soil	381
	Part VI : Summary of Scientific and Practical Procedures	
	Introduction	384
40.	Plant Analysis as an Aid in Evaluation Soil Nutrient Balance	387
41.	The Preference of Certain Plants for Certain Nutrients	390
42.	Procedures of the Modern Soil Scientist	394
43.	Improving the Physical Condition of a Soil	397
44.	Control of the Water Supply	402
45.	The Control and Improvement of the pH Value of an Acid Soil	407
46.	The Improvement of Alkaline Soils	413
47.	Soil Fertility in the Garden	420
	Appendix I	423
	Appendix II	427
	Glossary	429
	Subject Index	433