

# Contents

Preface, ix

List of Contributors, xi

In Memoriam, xiii

The Metric System, xv

The Last of the Virgin Sod, xvii

Flesh is Grass, xix

## PART I CHARACTERISTICS OF FORAGE SPECIES, 1

- 1 Forages and Grasslands in a Changing World, 3  
*C. Jerry Nelson, Kenneth J. Moore, and Michael Collins*
- 2 Structure and Morphology of Grasses, 19  
*Kenneth J. Moore and C. Jerry Nelson*
- 3 Structure and Morphology of Legumes and Other Forbs, 35  
*Robert B. Mitchell and C. Jerry Nelson*
- 4 Physiology of Forage Plants, 51  
*Jennifer W. MacAdam and C. Jerry Nelson*
- 5 Environmental Aspects of Forage Management, 71  
*Jeffrey J. Volenec and C. Jerry Nelson*
- 6 Grasses for Northern Areas, 87  
*Michael Collins and C. Jerry Nelson*
- 7 Grasses for Southern Areas, 103  
*Daren D. Redfearn and C. Jerry Nelson*
- 8 Legumes for Northern Areas, 117  
*Craig C. Sheaffer, M. Scott Wells, and C. Jerry Nelson*

- 9 **Legumes for Southern Areas, 133**  
*Lynn E. Sollenberger and Michael Collins*
- 10 **Forage Crops for Bioenergy and Industrial Products, 151**  
*Kenneth J. Moore and Emily A. Heaton*
- Compendium of Common Forages, 163**  
*Kenneth J. Moore*

## PART II FORAGE MANAGEMENT, 219

- 11 **Forage Establishment, 221**  
*Marvin H. Hall and Michael Collins*
- 12 **Forage Fertilization and Nutrient Management, 235**  
*David J. Barker and Michael Collins*
- 13 **Integrated Pest Management in Forages, 253**  
*R. Mark Sulc, William O. Lamp, and Michael Collins*

## PART III FORAGE UTILIZATION, 267

- 14 **Forage Quality, 269**  
*Michael Collins and Yoana C. Newman*
- 15 **Forage Utilization, 287**  
*Michael Collins, Kenneth J. Moore, and Craig A. Roberts*
- 16 **Forage-Related Animal Disorders, 301**  
*Michael Collins, Ali M. Missaoui, and Nicholas S. Hill*
- 17 **Preservation of Forage as Hay and Silage, 321**  
*Michael Collins and Kenneth J. Moore*
- 18 **Grazing Management Systems, 341**  
*Robert L. Kallenbach and Michael Collins*
- 19 **Managing Grassland Ecosystems, 357**  
*Charles P. West and C. Jerry Nelson*
- Appendix: Common and Botanical Names of Forages, 373
- Glossary, 385
- Index, 401