

Contents

FOREWORD, *Ezra Taft Benson*, p. v

PREFACE, *Alfred Stefferud*, p. vii

Principles

WE SEEK ; WE LEARN, *Charles E. Kellogg*, p. 1

THE BASIS OF FERTILITY, *Sterling B. Hendricks* and *Lyle T. Alexander*, p. 11

WHAT SOILS ARE, *Roy W. Simonson*, p. 17

PHYSICAL PROPERTIES, *M. B. Russell*, p. 31

GROWTH OF PLANTS, *C. H. Wadleigh*, p. 38

SOIL MOISTURE, *L. A. Richards* and *S. J. Richards*, p. 49

USE OF MOISTURE BY PLANTS, *Sterling A. Taylor*, p. 61

PH, SOIL ACIDITY, AND PLANT GROWTH, *W. H. Allaway*, p. 67

THE CHEMISTRY OF SOIL PH, *N. T. Coleman* and *A. Mehlich*, p. 72

Fertility

PLANT NUTRITION AND SOIL FERTILITY, *L. A. Dean*, p. 80

NITROGEN AND SOIL FERTILITY, *Franklin E. Allison*, p. 85

SOIL PHOSPHORUS AND FERTILITY, *Sterling R. Olsen* and *Maurice Fried*, p. 94

SOIL POTASSIUM AND FERTILITY, *R. F. Reitemeier*, p. 101

SULFUR AND SOIL FERTILITY, *Howard V. Jordan* and *H. M. Reisenauer*, p. 107

IRON AND SOIL FERTILITY, *R. S. Holmes* and *J. C. Brozun*, p. 111

ZINC AND SOIL FERTILITY, *Lloyd F. Seatz and J. J. Jurinak*,
p. 115

BORON AND SOIL FERTILITY, *Darrell A. Russel*, p. 121

COPPER AND SOIL FERTILITY, *Walter Reuther*, p. 128

MANGANESE AND SOIL FERTILITY, *G. Donald Sherman*,
p. 135

TRACE ELEMENTS, *P. R. Stout and C. M. Johnson*, p. 139

ORGANIC MATTER, *F. E. Broadbent*, p. 151

LIVING ORGANISMS IN THE SOIL, *Francis E. Clark*, p. 157

TOXIC ELEMENTS IN SOILS, *Firman E. Bear*, p. 165

Practices

HOW TO DETERMINE NUTRIENT NEEDS, *Frank G. Viets, Jr.*,
and *John J. Hanway*, p. 172

SOIL REACTION AND LIMING, *K. Lawton and L. T. Kurtz*,
p. 184

TRENDS IN FERTILIZERS, *J. Richard Adams*, p. 194

MATERIALS AND MIXTURES, *K. D. Jacob*, p. 200

NEW AND BETTER FERTILIZERS, *E. L. Newman and W. L. Hill*, p. 210

APPLYING FERTILIZERS, *R. L. Cook and Walter C. Hulburt*,
p. 216

FARM MANURE, *Myron S. Anderson*, p. 229

COMPOSTS, PEATS, AND SEWAGE SLUDGE, *H. W. Reuszer*,
p. 237

MAINTAINING ORGANIC MATTER, *W. V. Bartholomezo*, p. 245

GREEN MANURE AND COVER CROPS, *T. Hayden Rogers and Joel E. Giddens*, p. 252

SOIL MANAGEMENT AND CROP QUALITY, *Kenneth C. Beeson*,
p. 258

THE ECONOMICS OF FERTILIZERS, *L. B. Nelson and D. B. Ibach*, p. 267

Soil Care

PRINCIPLES OF TILLAGE, *W. A. Raney and A. W. Zingg*, p. 277

SALINE AND ALKALI SOILS, *C. A. Bower and Milton Fireman*, p. 282

EROSION ON CULTIVATED LAND, *B. D. Blakely, J. J. Coyle, and J. G. Steele*, p. 290

EROSION OF SOIL BY WIND, *W. S. Chepil*, p. 308

HOW TO CONTROL A GULLY, *C. J. Francis*, p. 315

STABILIZING SAND DUNES, *A. D. Stoesz and Robert L. Brown*, p. 321

SOIL MANAGEMENT AND INSECT CONTROL, *Walter E. Fleming*, p. 326

SOILBORNE PLANT DISEASES, *Francis E. Clark, William J. Zaumeyer, and John T. Presley*, p. 333

Moisture

CONSERVING SOIL MOISTURE, *Chester E. Evans and Edgar R. Lemon*, p. 340

IRRIGATION IN ARID REGIONS, *Wayne D. Criddle and Howard R. Haise*, p. 359

IRRIGATION IN THE EAST, *T. H. Quakenbush and M. D. Thorne*, p. 368

DRAINAGE PROBLEMS AND METHODS, *T. W. Edminster and Ronald C. Reeve*, p. 378

Systems

CROPPING SYSTEMS AND SOIL, *W. H. Allaway*, p. 386

SOIL CLASSIFICATION AND SURVEYS, *Guy D. Smith and Andrew R. Aandahl*, p. 396

THE USE OF SOIL MAPS, *A. M. Hedge and A. A. Klingebiel*, p. 400

THREE FARMING SYSTEMS, *E. L. Langsford, Charles P. Butler, C. W. Crickman, and Trimble R. Hedges*, p. 411

ECONOMICS OF CROPPING SYSTEMS, *Earl O. Heady*, p. 426

FACTORS OF INCOME, *Orlin J. Scoville*, p. 433

LONGTIME INVESTMENTS IN SOIL MANAGEMENT, *M. L. Upchurch*, p. 441

FINANCING CHANGES IN SOIL MANAGEMENT, *J. H. Atkinson* and *Lowell S. Hardin*, p. 447

- Regions** SOIL MANAGEMENT IN REGIONS, *Carleton P. Barnes*, p. 451
- THE NORTH PACIFIC VALLEYS, *H. B. Cheney*, p. 456
- THE DRY MILD-WINTER REGION, *D. G. Aldrich*, p. 467
- THE PACIFIC NORTHWEST WHEAT REGION, *G. M. Horner*, *W. A. Starr*, and *J. K. Patterson*, p. 475
- THE GRAZING-IRRIGATED REGION, *Wynne Thorne*, p. 481
- THE NORTHERN GREAT PLAINS, *E. B. Norum*, *B. A. Krantz*, and *H. J. Haas*, p. 494
- THE WINTER WHEAT AND GRAZING REGION, *J. A. Hobbs*, p. 505
- THE SOUTHERN PLAINS, *J. R. Johnston*, p. 516
- THE MISSISSIPPI DELTA REGION, *Perrin H. Grissom*, p. 524
- THE COASTAL PRAIRIES, *R. K. Walker* and *R. J. Miears*, p. 53'
- THE MIDLAND FEED REGION, *W. H. Pierre* and *F. F. Riecken*, p. 535
- THE NORTHERN LAKE STATES, *R. J. Muckenhirn* and *K. C. Berger*, p. 547
- THE EAST-CENTRAL UPLANDS, *Eric Winters*, p. 553
- SOUTHEASTERN UPLANDS, *R. W. Pearson* and *L. E. Ensminger*, p. 579
- FLORIDA AND FLATWOODS, *J. R. Henderson* and *F. B. Smith*, p. 595
- THE NORTHEAST, *N. C. Brady*, *R. A. Struchtemeyer*, and *R. B. Musgrave*, p. 598
- MIDDLE ATLANTIC COASTAL PLAIN, *William J. Hanna* and *S. S. Obenshain*, p. 620

Special Uses

SOIL MANAGEMENT FOR PASTURES, *R. R. Robinson, R. E. Blaser, and H. B. Peterson*, p. 628

SOIL MANAGEMENT ON RANGES, *C. H. Wasser, Lincoln Ellison, and R. E. Wagner*, p. 633

GRASSES, *E. A. Hollowell*, p. 642

LEGUMES, *E. A. Hollowell*, p. 650

TOBACCO, *W. E. Colwell*, p. 655

MANAGING SOILS FOR RICE, *M. B. Sturgis*, p. 658

FIELD CROPS, *John H. Martin*, p. 663

HOME GARDENS AND LAWNS, *Charles E. Kellogg*, p. 665

ORNAMENTAL PLANTS, *S. L. Emsweller, N. W. Stuart, and Curtis May*, p. 688

VEGETABLES, *Victor R. Boswell*, p. 692

SOIL MANAGEMENT FOR ORCHARDS, *Damon Boynton and John R. Magness*, p. 699

SOIL MANAGEMENT FOR FOREST TREES, *Frank W. Woods, Otis L. Copeland, Jr., and Carl E. Ostrom*, p. 710

SHELTERBELTS AND WINDBREAKS, *Ernest J. George, Ralph A. Read, E. W. Johnson, and A. E. Ferber*, p. 715

SOIL AND THE GROWTH OF FORESTS, *Earl L. Stone, Jr., and Paul E. Lemmon*, p. 721

FOREST PRACTICES AND PRODUCTIVITY, *V. L. Harper, Bernard Frank, and W. E. McQuilkin*, p. 732

RESEARCH SERVICES, *H. C. Knoblauch*, p. 741

CONTRIBUTORS, p. 746

GLOSSARY, p. 751

INDEX, p. 771