Special Report 56

New Mexico State University College Ranch and Jornada Experimental Range:

A Summary of Research, 1900 — 1983

NEW MEXICO STATE UNIVERSITY
Agricultural Experiment Station

NEW MEXICO STATE UNIVERSITY COLLEGE RANCH AND JORNADA EXPERIMENTAL RANGE:

A SUMMARY OF RESEARCH, 1900 - 1983

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FORWARD

In 1982, the New Mexico State University College Ranch became the site of a Long Term Ecological Research (LTER) project, funded by the National Science Foundation. The interdisciplinary nature of the project and the potential for extensive cooperation with non-resident investigators illuminated a need for a comprehensive indexing of published research conducted at the College Ranch and the adjoining USDA Jornada Experimental Range. The resulting synthesis features a brief narrative history and outline of research, providing information for both technical and non- technical readers, and a bibliography and associated keyword-citation index designed as references in research pursuits. We thank the following individuals for assistance in identification and retrieval of pertinent literature and many helpful comments and suggestions:

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CONTENTS

INTRODUCTION

The New Mexico State University College Ranch is a 25,900 ha reserve created in 1927. The contiguous USDA Jornada Experimental Range was established in 1912, and consists of approximately 78,266 ha. Both the Jornada and the College Ranch have been administered for research since inception, fostering an extensive assemblage of scientific publications and reports. The Jornada has received additional formal recognition through scientific site designations, including Ecological Reserve (Institute of Ecology), Biosphere Reserve (UNESCO Man and the Biosphere Program), and Grassland Validation Site (U.S./International Biological Programme (IBP)/National Science Foundation (NSF)). The College Ranch was designated as a Desert Validation Site (U.S./IBP) and recently, as the Long Term Ecological Research Desert Site (NSF). These designations are associated with national and international research programs which have supported numerous projects in a broad spectrum of biological studies.

A history and general description of the Jornada area is presented in The Jornada Experimental Range by Fred N. Ares (21) and in The Jornada Experimental Range, Las Cruces, New Mexico, a bulletin of the USDA Science and Education Administration (191). Additional cultural data from the area is also available from 2 archaeological surveys conducted for seismic clearance, describing historic and prehistoric sites in the region.

The earliest research publications from the Jornada and College Ranch areas (1900-1950) include land form and water resource descriptions, plant species identifications, vegetative maps, and descriptions of major plant communities and soil-vegetation associations. Much of the habitat and character descriptions of semi-arid plant species appearing in Flora of New

Mexico by E. O. Wooten and P. C. Standley (460) were based on studies conducted in the region. An historic description of the origin of mesquite-sand dune areas associated with overgrazing and subsequent successional stages in grassland re-establishment appeared in 1929. Growth and life history characteristics of major range grasses (particularly black grama and tobosa) were investigated in conjunction with range management activities. With the exception of a species listing for amphibians and reptiles of the area, no zoological studies were published during this time. A major segment of research during this early period emphasized range management, including stocking levels and systems, nutritive value of range forage, nutrient status of cattle, effects of nutrient and roughage supplementation, identification and control of range plants toxic to livestock, and water spreading and retaining techniques. Eradication of mesquite and associated grass seeding techniques were initiated during this time. Animal science investigators examined other features of livestock management, such as bull selection, peak productivity ages of cows, and importance of body type, size, and sex of cattle in determining range and feedlot performance. Many of the publications resulting from these studies appeared as agricultural bulletins and popular articles offering information and directives for improved ranching success on semi-arid rangelands. More detailed reviews of early range and animal science investigations have been presented in Research on the College Ranch by J. H. Knox, W. E. Watkins, M. Koger, and K. A. Valentine (215) as well as in the previously cited bulletins on the Jornada Experimental Range. Soil and associated vegetative sample data for the area are available from an original Land Office Survey of 1858, and subsequent surveys of 1915, 1928, and 1963. An initial study of soil strata was conducted by J. O. Veatch in 1918 (unpublished report), followed by detailed soil strata analyses carried

out in the 1930's. Rainfall records for the Jornada Experimental Range headquarters have been maintained since 1914, and at other locations since the 1930's.

During 1950-1970, several notable botanical studies appeared, including a detailed life history description for creosotebush, and vegetative community analyses identifying the historical background of succession on various soil types and influences of land use practices in producing the current species assemblages. Experiments conducted with grass and shrub seeds revealed the inhibitory effects of aqueous extracts of creosotebush material on germination; additional studies demonstrated germination response to varied temperature and moisture regimes. The range management emphasis on brush control was expanded to include experiments with mechanical and chemical control of mesquite, creosotebush, and tarbush, with associated grass seeding efforts. These studies demonstrated costs and innovative techniques for improvement of range for livestock use. Detailed chemical analyses of many range grasses and forbs documented marked seasonal variations in nutrient content. Grazing distribution, behavior, and forage selection by cattle of various breeds were also addressed as aspects of range management. Heritability of economically valuable traits and certain genetic defects in Hereford cattle was described from analyses of the detailed records for research herds at the College Ranch and at New Mexico Agricultural Experiment Station sites. A series of soils studies were published in 1961-1979 which described distinctive features of the soil profile of the region, emphasizing the nature and origin of a carbonate-impregnated horizon. Geomorphology of the Jornada del Muerto basin and stratigraphy of surrounding mountains were also described during this period. Entomological research focused on insect species occurring on range grasses. In addition to life history and food

habits studies of several vertebrate species, a series of publications were produced describing the composition and distribution of rodent communities, their role in range conditions and their response to rodenticide treatments.

Since 1970, numerous plant studies have focused on adaptive specializations in physiology, morphology, and reproductive strategies in desert species. Much of the recent botanical research was conducted in association with the U.S./IBP programs. Creosotebush received extensive attention, through investigations of soil-water relationships, primary productivity, tissue-water movements, leaf senescence, and shrub-grass associations. Major studies of photosynthesis and growth and reproduction in yucca were conducted. Increased emphasis on experimental research involved manipulative studies of grass and shrub responses to moisture and nutrient amendments, chemical pesticide and herbicide applications, and varying grazing and harvesting systems. Animal science investigators have identified factors influencing milk production, calving interval, postweaning growth, feedlot and carcass performance, and reproduction in Brangus, Hereford and crossbred cattle utilizing semi-arid rangelands. In addition to grazing manipulation studies, range scientists have analyzed seasonal variation in range plant availability and utilization by livestock and described overall primary productivity of the grassland ecosystem. Brush and toxic plant control experiments continue, including assessment of shrub use by goats, and identification of insect species which attack noxious plants. Several authors have published analyses of long-term vegetative data from the Jornada, describing the interaction of climate, land use practices, soil movement, and plant community succession, in producing the mesquite dunelands which are widespread in the region. Factors in the nature and progression of desertification including soil erosion, grassland composition, and caliche formation are currently under study by several investigators.

A major soil-vegetation study published in 1973 portrays the relationship of plant growth to soil texture and topography, as features determining soil moisture availability. This paper includes a notable discussion of the function of the caliche layer as a barrier to moisture loss, maintaining long-term moisture availability to plants during dry seasons. Relative proportions of calcium, magnesium, and organic carbon in various soil horizons have also been examined. The Desert Project Soil Monograph (131), published in 1979, and a 1980 soil survey of Dona Ana County (43) summarize the nature and extent of local soil formations. These analyses of soil structure and composition are complemented by recent studies of soil microbiology identifying soil microfauna components, soil respiration, microbial activities in protein degradation, and variations in microbial activity in response to herbicide contamination.

Zoological research has received increasing attention, fostered in part through funds from the U.S./IBP program. The body of data collected during the U.S./IBP projects and subsequent extensions of some of those studies have produced a wide array of publications. Among these are a series of papers on thermal physiology, foraging activities, distributions, and population interactions of several ant species. Another segment of recent research has focused on characterization of decomposition rates and associated nutrient cycling in desert soils, including identification of soil fauna communities and their role in decomposition. Descriptions of density and diversity in lizard, rodent, and bird communities in several diverse habitats were generated through the U.S./IBP program. More recently, data on rodent, arthropod, and bird communities in mesquite-sand dune habitats of the Jornada were collected in association with a USDA/SEA brush control project. Detailed environmental data, including precipitation, temperature, humidity, radiation, and soil temperature and moisture content were also collected during most of these more recent projects.

Numerous studies of individual vertebrate species have been conducted since 1970. These include thermal physiology and water balance experiments (reptiles and amphibians), behavioral observations (lizards, birds, and mammals), food habit analyses (birds, rodents, rabbits, and pronghorn), and competitive interaction investigations (rodents and birds). As noted earlier in relation to botanical research, much of the recent zoological work has also emphasized an experimental approach, involving manipulative field studies, often supplemented with laboratory observations. Many of these studies have incorporated analyses of the effects of various range management practices (chemical and mechanical brush control, use of insecticides, and grazing allotments) on various animal groups (e.g. ants, birds, rodents), as well as on individual species. The pervasive topic addressed in current research is identification of the patterns and mechanisms of organism response to environmental variables, and the adaptive nature of those responses relative to the environmental parameters unique to a desert ecosystem.

Funding from the U.S. Department of Agriculture, National Science Foundation, New Mexico Agricultural Experiment Station, New Mexico State University and numerous other public and private agencies has provided the strong, continuing support necessary to generate this extensive scientific record. The past and present investigators participating in research on the Jornada Experimental Range and the College Ranch include representatives from many disciplines at New Mexico State University, as well as visiting scientists from the United States, Mexico, and abroad. Over 100 theses and dissertations involving research at the Jornada and the College Ranch have been produced since 1956, most of which have later appeared in scientific journals.

RESEARCH TOPICS

The following outline summarizes major topics of research conducted at the New Mexico State University College Ranch and the USDA Jornada Experimental Range. The outline is organized by discipline (zoology, animal science, etc.) and progresses from intensive single species studies to more general subjects encompassing community interactions and processes, and research and management techniques within each discipline. Many topic categories include research from several disciplines (i.e. germination experiments have been conducted in botany, range science, and agronomy) and are arbitrarily assigned a position in the outline.

I. Botany

A. Single Species/Taxon

1. Yucca elata, Y. baccata (Liliaceae) - yucca

a. leaf photosynthesis.

b. morphology.

c. growth and reproduction.

2. Bouteloua eriopoda (Gramineae) - black grama: growth and reproductive characteristics and response to grazing and drought.

3. Panicum obtusum (Gramineae) - vine mesquite

a. biomass variation.

b. response to grazing.

4. Atriplex canescens (Chenopodiaceae) - fourwing saltbush: reproduction.

5. Prosopis glandulosa (Mimosoideae) - mesquite: size variation and density.

6. Larrea tridentata (Zygophyllaceae) - creosotebush
   a. life history.
   b. leaf senescence.
   c. tissue water movements.
   d. allocation of vegetative versus reproductive effort associated with moisture amendment.
   e. response to water stress associated with soil depth.
   f. primary production and carbon allocation.
   g. presence of nordihydroguairetic acid.
   h. association with bush muhly.

7. Sphaeralcea coccinea, S. grossulaerifolia, S. munroana (Malvaceae) - globemallow: germination.

8. Chilopsis linearis (Bignoniaceae) - desert willow: vegetative versus reproductive allocations.

9. Xanthocephalum sarothrae (Compositae) - snakeweed: biomass variation.
10. Bryophyta: species list.
11. Gramineae: stem morphology; germination and seed characteristics.
12. Nyctagineaceae: flowering habit.

B. Plant Communities
   1. Plant community classifications, species listings, and succession associated with soil types.
   2. Relationships of plants to soil types and soil water-potentials.

3. Root:shoot ratios.

4. Characteristics of CO_2 exchange and distribution of C3, C4, and CAM plants.

5. Photosynthetic rate/leaf resistance associated with leaf morphology.

6. Responses to nitrogen amendment, insecticides, herbicides, drought, and defoliation.

7. Plant growth models.

8. Grass and forb demography.

9. Reproduction and growth in desert annuals.

10. Short-term water and energy flow.

11. Temporal variation in grassland community structure and productivity, associated with presence or absence of grazing.

12. Interaction of drought and grazing in desertification.

C. Germination

1. Germination characteristics of specific grasses, forbs and shrubs.

2. Germination/emergence rates from random soil samples.

3. Inhibition of grass germination by aqueous extracts of snakeweed and creosotebush.

4. Germination and transplantation of desert species for use as ornamentals.

D. Techniques

Point series sampling, pace transect, belt transects, dry weight estimation, computer chart quadrat interpretation, and photointerpretation.

II. Zoology

A. Single Species/Taxon - Diplopoda: *Orthoporus ornatus* millipede: life history and physiology.

B. Single Species/Taxon - Insecta

1. *Chirothrips falsus* (Thysanoptera: Thripidae) - thrip: life history and control on grass.

2. *Nicrophorus carolinus* (Coleoptera: Silphidae) - burying beetle: feeding behavior.

3. *Myrmecocystus carolae*, *M. depilis*, *M. mimicus*, *M. romainei*, *M. mexicanus* (Hymenoptera: Formicidae) - honey-pot ant: thermal physiology.

4. *Novomessor cockerelli*, (Hymenoptera: Formicidae)

   a. dessication.

   b. foraging.

5. *Pheidole* spp. (Hymenoptera: Formicidae): distribution and foraging.

6. *Pogonomyrmex rugosus*, *P. occidentalis*, *P. desertorum*, *P. californicus* (Hymenoptera: Formicidae) - harvester ant.

   a. densities.

   b. foraging and territoriality.

   c. seed selection.

   d. response to predation.

   e. dessication.

7. *Formica perpilosa* and Trachymyrmex smithi (Hymenoptera: Formicidae): foraging ecology.

8. *Xylocopa californica* (Hymenoptera: Anthophoridae) - carpenter bee: nesting and reproduction.

9. Haematobia irritans (Diptera: Muscidae) - horn fly: host location.

10. Tegeticula yuccasella (Lepidoptera: Incurvariidae) - yucca moth: specificity to Yucca spp.

11. Tenebrionidae: seasonal activity patterns among different species.

C. Insect Communities

1. Soil microarthropods and decomposition

a. termites: litter colonization and location; role in decomposition, nutrient cycling and soil physics.

b. microarthropods and other decomposers: density and diversity associated with moisture amendment, inhibitors, and litter distribution; decomposition rates.

2. Effects of girdling and boring insects (Bostrichidae) on mesquite.

3. Variations in ant density and diversity associated with habitat, vegetation, soil type; effects of herbicides; desiccation rates.

4. Insect species associated with range grasses.

D. Single Species/Taxon - Reptilia and Amphibia

1. Bufo cognatus, B. debilis, Scaphiopus hammondi (Bufonidae, Pelobatidae) - toads: physiology and survival associated with burrowing.

2. Ambystoma tigrinum (Ambystomatidae) - tiger salamander: thermal physiology associated with habitat.

3. Phrynosoma cornutum, P. douglassi (Iguanidae) - horned lizard

a. water balance and thermoregulation.

b. feeding behavior.

4. Urosaurus ornatus (Iguanidae) - tree lizard: behavior.

E. Amphibian and Reptile Communities

1. Species list.

2. Density and diversity in lizard communities and anuran communities associated with environmental variables.

F. Single Species/Taxon - Aves

1. Zenaida macroura (Columbiformes: Columbidae) - mourning dove: food habits.

2. Lophortyx gambelii and Callipepla squamata (Galliformes: Phasianidae) - Gambel's quail and scaled quail: physiology.

3. Athene cunnicularia (Strigiformes: Strigidae) - burrowing owl: habitat, food and reproduction.

4. Chordeiles minor, C. acutipennis Caprimulgiformes: Caprimulgidae) - nighthawk: competition in 2 species.

5. Tyrrannus verticalis (Passeriformes: Tyrannidae) - western kingbird: reproductive attributes associated with habitat.

6. Spizella atrovulgaris (Passeriformes: Fringillidae) - black-chinned sparrow: behavior and reproduction.

G. Bird Communities

1. Density and diversity; structure.

2. Species list.

3. Mobbing behavior.

4. Response to chemical brush control

H. Single Species/Taxon - Mammalia

1. Dipodomys spectabilis, D. merrami, D. ordii (Rodentia: Heteromyiidae) - kangaroo rat

a. reproduction.

b. burrow environment.

c. physiology.

d. response to brush control.

e. food habits.

f. effect on grassland community.

2. Chaetodipus intermedius, C. penicillatus (Rodentia: Heteromyiidae) - pocket mouse: habitat, physiology, behavior.

3. Neotoma albigula, N. micropus (Rodentia: Cricetidae) - woodrat: distribution of 2 species by habitat.

4. Onychomys leucogaster (Rodentia: Cricetidae) - grasshopper mouse: activity patterns.

5. Lepus californicus (Lagomorpha: Leporidae) - black-tailed jackrabbit: food habits.

6. Canis latrans (Carnivora: Canidae) - coyote: food habits.

7. Antilocapra americana (Artiodactyla: Antilocapridae) - pronghorn: habitat and distribution.

I. Mammalian Communities: Rodentia

1. Composition, changes in density and diversity associated with precipitation, vegetation, and rodenticides.

2. Habitat selection.

III. Soil Microbiology

A. Survey of aerobic spore-forming bacteria.

B. Microbial degradation of protein amendments.

C. Microbial response to herbicide treatments.

D. Soil repiration rates.

IV. Range and Animal Sciences

A. General

1. Growth and germination characteristics of grass species; responses to various grazing systems.

2. Use of non-grass plants for supplemental livestock feed.
3. Determination of plant volume for stocking level.
4. Grass responses to defoliation, fertilization, and burning.
5. Plant species utilized by cattle; nutritive value, composition and availability of forage species.
6. Water retention structures to increase available soil moisture.
7. Generalized plans for rangeland management; modeling of grazing management systems.

B. Control of Brush and Toxic Plants

1. Growth characteristics, distribution, toxicity, and associated management directives for toxic plants.
2. History of invasion of brush and weed species and associated management practices.
3. Techniques and effectiveness of chemical and mechanical control measures for creosotebush, mesquite and tarbush.
4. Techniques and effectiveness of environmental modification and grass reseeding following brush eradication.

C. Livestock Management

1. Performance of Hereford, Brangus, Santa Gertrudis, and cross-bred cattle on semidesert ranges.
   a. milk production.
   b. calving interval.
   c. reproductive output.
   d. postweaning growth.
   e. feedlot performance.
   f. carcass quality.
2. Genetic defects in Hereford cattle; genetic selection systems in cattle breeding.

3. Livestock behavior.

   a. forage selection and use efficiency.

   b. activity patterns associated with water, salt, and seasonally varying forage distribution.

4. Cattle nutrition and associated blood biochemistry.

   a. seasonal nutrient status for protein, phosphorus, calcium and vitamin A.

   b. seasonal micronutrient status.

   c. effects of nutrient supplementation.

   d. digestability of various forage plants.

V. Abiotic

A. General-geographical maps, soil maps, climate data.

B. Geology

1. Geomorphology and hydrology of Jornada del Muerto basin.

2. Stratigraphy of surrounding mountains.

3. Quarternary origins of current geologic formations.

C. Soils

1. Relationship of soil moisture to precipitation, soil profile, and landscape position.

2. Soil composition and moisture characteristics associated with various vegetative communities.

3. Correlations between organic carbon and C_aCO_3, Mg, and Ca.

4. Description and origin of carbonate impregnated k-horizon; morphology of argillis horizon.

5. Relationship of soil development to horizon age.

6. Soil movement associated with dune formation.

VI. Historical

A. Prehistoric and historic sites on seismic clearance transects.

B. Historical narratives for the Jornada and College Ranch.

C. Reports of early (pre-1900) exploratory expeditions in area.

VIII. IBP Research

Much information contained in the various IBP reports has been published and is described in the appropriate topic section. Many of the technical reports are available only through individual authors.

A. Desert Site

1. Annual reviews of research.
2. Individual reports on arthropods, decomposition, meteorological data, plant distributions, productivity and phenology, and seed germination potentials.
3. Reports integrating data from all IBP Desert Sites and synthesizing generalized models for desert ecosystem dynamics.

B. Grassland Site

1. Annual reviews of research.
2. Individual reports on primary production, arthropod, rodent, and bird communities, and decomposition.
3. Reports integrating data from all IBP Grassland Sites and synthesizing generalized models for grassland ecosystem dynamics.

KEYWORD LIST

The following set of keywords have been used to identify the major features of each citation. A computerized bibliographic search program is employed to retrieve and display citations associated with a given set of keywords.

A current citation index and the keyword searching programs are maintained on computer files at the Long Term Ecological Research Data Management Office at New Mexico State University. A supporting reprint collection is also maintained for reference use by interested investigators.

AMPHIBIAN
ARCHAEOLOGY
ARTHROPODA
ARTIODACTYLA
AVES
BEHAVIOR
BIOCHEMICAL
BIOMASS
BLOOD
BOOK
BRUSH-CONTROL
BRYOPHYTA
CARBON
CARBON-DIOXIDE
CARNIVORA
CATTLE
COMMUNITY
CREOSOTE
DECOMPOSITION
DEMOGRAPHIC
DESERT
DISEASES
DISSERTATION
DISTRIBUTION
DROUGHT
(BIO) ENERGETICS
EVAPOTRANSPIRATION
FERTILIZERS
FLORAL
FOOD HABITS
FUNGI
GENETICS

GEOLOGICAL

(BLACK)-GRAMA

GERMINATION

GRASSLAND

GRAZING

HERBICIDE

HISTORY

HYDROLOGIC

INSECT

JORNADA-EXP.-RANGE

LAGOMORPHA

LIST

LITTER

MANAGEMENT

MASTERS-THESIS

MESQUITE

METABOLISM

METEOROLOGICAL

MICROBIAL

MODEL

MORPHOLOGICAL

(BUSH)-MUHLY

NESTBOXES

NEW-MEXICO-STATE

NITROGEN

NUTRIENTS

NUTRITION

PARASITES

PESTICIDES

PHENOLOGY

PHOTOSYNTHESIS

PHYSIOGRAPHIC

PHYSIOLOGICAL

PLANTS

POPULAR ARTICLE

PRECIPITATION

PREDATION

PRODUCTIVITY

PROTEIN

RANGELAND

REFEREED-JOURNAL

REPRODUCTIVE

REPTILIA

REVIEW

RODENT

ROOT

SALT

SEED

SOIL

SUCCESSION

SURVIVAL

TOBOSA

TECHNICAL-BULLETIN

TECHNIQUE

TEMPERATURE

THALLOPHYTA

THERMAL-REGULATION

TOXICITY

TROPHIC

US-IBP

VERTEBRATA

YUCCA

KEYWORD - CITATION INDEX

The following summary gives the identification numbers (from the appended bibliography) of all citations associated with each keyword.

AMPHIBIAN

74 94 95 96 233 251 380 423 425

ARCHAEOLOGY

102 398

ARTHROPODA

36 67 70 71 72 73 105 107 108 109 111 112 117 118 189 192 193 194 202 203 204 241 246 252 284 291 315 328 329 330 331 332 333 334 335 336 339 340 347 348 349 391 392 393 394 403 404 406 407 411 413 414 415 416 417 419 420 424 426 427 428 429 430 431 432 434 435 438 439 450 451 461

ARTIODACTYLA

110 126 134 184

AVES

30 44 45 77 91 93 234 241 292 294 299 300 307 379 442 443

BEHAVIOR

30 67 92 93 140 164 171 183 189 204 253 263 335 340 348 379 399 402 413 415 416 417 420 429 432 435

BIOCHEMICAL

34 146 200 211 213 264 265 266 285 298 343 354 377 383 384 389 454

BIOMASS

5 25 107 113 119 179 205 259 260 261 290 334 363

BLOOD

213 264 267 298 308 387 390

BOOK

21 36 75 157 158 240 241 416 424 460

GRAZING

1 10 18 19 27 42 47 49 51 53 54 56 62 69 122 135 136 140
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383 395 447 464 468 470

HERBICIDE

154 159 162 174 177 231 275 326 375 436 450 451

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6 7 21 41 42 102 123 154 190 191 232 244 286 398

HYDROLOGIC

22 24 26 43 105 161 197 201 324 362

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67 105 107 111 112 117 118 189 192 193 194 202 203 204 241 252 284 315
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JORNADA-EXP.-RANGE

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BIBLIOGRAPHY

1 Abdalla, S.H. 1980. Application of simulation techniques to evaluate grazing management policies in the semidesert grasslands of southern New Mexico. Ph.D. Dissertation, New Mexico State Univ. 182 pp.

2 Abernathy, G.H. and C.H. Herbel. 1963. Brush eradicating, basin pitting, and seeding machine for arid to semiarid rangeland. J. Range Manage., 26:189-192. (N.M. Agr. Exp. Sta. Journ. Art. 417)

3 Aguirre, E.L. 1971. Effects of watering treatments on emergence of plant species in soil collected from different desert grassland sites. M.S. Thesis, New Mexico State Univ. 48 pp.

4 Alberico, M.S. 1978. Species diversity of nocturnal rodents in disturbed desert-grassland habitats. Ph.D. Dissertation, New Mexico State Univ. 80 pp.

5 Almeida-Martinez, R. 1981. Seasonal defoliation and growth responses of Muhlenbergia porteri Scribn. Ex Beal. in pure stands and in association with Larrea tridentata (DC) Coville, with emphasis on structural analysis. Ph.D. Dissertation, New Mexico State Univ. 126 pp.

6 Anon. 1936. Jornada Experimental Range. Map. USDA.

7 Anon. 1957. Jornada Experimental Range. Map. USDA.

8 Ares, F.N. 1936. How the use of salt obtains better forage utilization on a cattle range. Cattleman, 22(12):20-22.

9 Ares, F.N. 1936. How better utilization of range was obtained through the use of inexpensive water holes. Cattleman, 23(1):21-22.

10 Ares, F.N. 1939. Cutting tobosa grass for hay. Cattleman, 25(9):47-50.

11 Ares, F.N. 1939. Electric fence effective on range. Amer. Cattle Prod., 20(9):18.

12 Ares. F.N. 1939. Range forage utilization. Amer. Hereford J., 29(23):39,46.

13 Ares, F.N. 1941. Cattle losses reduced by grubbing poisonous drymaria. N.M. Stockman, 6(10):11-12.

14 Ares. F.N. 1942. Trucking versus trailing cattle from ranch to railroad. Cattleman, 28(8):19.

15 Ares. F.N. 1943. Range cattle management on the Jornada Range. Amer. Cattle Prod., 24(1):7-10.

16 Ares, F.N. 1943. What does a range calf cost? N.M. Stockman, 8(12):3-4.

17 Ares, F.N. 1944. Record of alligator juniper (Juniperus pachyphloen) on the Jornada Experimental Range, New Mexico. Am. Midl. Nat., 32:518.

18 Ares, F.N. 1953. The use of meal-salt mix for better distribution of cattle. Amer. Cattle Prod., 35(4):9-11.

19 Ares, F.N. 1953. Better cattle distribution through the use of meal-salt mix. J. Range Manage., 6:341-346.

20 Ares, F.N. 1964. Cry alarm..killer loose... N.M. Stockman, 29:55.

21 Ares, F.N. 1974. The Jornada Experimental Range: an epoch in the era of southwestern range management. Soc. Range Manage. Range Monograph, No. 1. 74 pp.

22 Atwood, T.L. 1983. Ecology of a sand sage community in southern New Mexico. M.S. Thesis, New Mexico State Univ. 71 pp.

23 Baca, E.C. 1961. The accuracy, precision and efficiency of the point series method of vegetation sampling with reference to the low vegetative cover of the semi-desert grassland. M.S. Thesis, New Mexico State Univ. 40 pp.

24 Bailey, O.F. 1925. Water availability and grass root distribution in selected soils. M.S. Thesis, New Mexico State Univ. 67 pp.

25 Balding, F.R. 1971. The distribution of shrubs along a soil water potential gradient in a desert arroyo system. M.S. Thesis, New Mexico State Univ. 21 pp.

26 Balding, F.R. and G.L. Cunningham. 1974. The influence of soil water potential on the perennial vegetation of a desert arroyo. Southwest. Nat., 19:241-248.

27 Beck, R.F. 1978. A grazing system for semiarid lands. pp. 569-572, In Hyder, D.H. (Ed.) First Inter. Rangeland Conf., Soc. Range Manage. Vol. I. (N.M. Agr. Exp. Sta. Journ. Art. 105)

28 Belling, T.H. 1962. Genetic effect of cardiac ventricular septal defect in Hereford cattle. Veterinary Medicine, 57:965-968. (N.M. Agr. Exp. Sta. Journ. Art. 189)

29 Berhe, A. 1973. Factors affecting calving interval of Hereford and Santa Gertrudis cows at the Jornada Experimental Range. M.S. Thesis, New Mexico State Univ. 64 pp.

30 Best, T.R. 1969. Habitat, annual cycle, and food of burrowing owls in southcentral New Mexico. M.S. Thesis, New Mexico State Univ. 34 pp.

31 Blackwell, R.L., D.E. Anderson and J.H. Knox. 1956. Age incidence and heritability of cancer eye in Hereford cattle. J. Anim. Sci., 15:943-951. (N.M. Agr. Exp. Sta. Journ. Art. 101)

32 Blackwell, R.L., J.H. Knox and E.H. Cobb. 1959. A hydrocephalic lethal in Hereford cattle. J. Heredity, 60:143-148. (N.M. Agr. Exp. Sta. Journ. Art. 115)

33 Blackwell, R.L., J.H. Knox, C.E. Shelby and R.T. Clark. 1962. Genetic analysis of economics characteristics of young Hereford cattle. J. Anim. Sci., 21:101-107. (N.M. Agr. Exp. Sta. Journ. Art. 166)

34 Botkin, C.W. and P.C. Duisberg. 1949. The nordihydroguairetic acid content of the creosotebush. N.M. Agr. Exp. Sta. Bull. 349.

35 Branscomb, B.L. 1956. Shrub invasion of a southern New Mexico desert grassland range. J. Range Manage., 11:129-132.

36 Breymeyer, A.I. and G.M. Van Dyne (Eds.) 1980. Grasslands, systems analysis and man. Cambridge Press, London.

37 Bridges, J.O. 1941. Reseeding trials on arid rangeland. N.M. Agr. Exp. Sta. Bull. 278.

38 Bridges, J.O. 1942. Reseeding practices for New Mexico ranges. N.M. Agr. Exp. Sta. Bull. 291.

39 Brown, L.S. 1922. The utility of yucca and chamisa as range supplements. N.M. Agr. Exp. Sta. Bull. 133.

40 Bryson, R.A., B. Harden, V. Mitchell and T. Webb, III. 1970. Some aspects of ecological climatology of the Jornada Experimental Range, New Mexico. pp. 12-74, In: Wright, R.G. and G.M. Van Dyne (Eds.) Simulation and Analysis of Dynamics of a Semi-desert Grassland. Sci. Series 6. Range Sci. Dept., Colorado State Univ., Ft. Collins.

41 Buffington, L.C. 1964. Vegetational changes on a semi-desert grassland range from 1958 to 1963. M.S. Thesis, New Mexico State Univ. 93 pp.

42 Buffington, L.C. and C.H. Herbel. 1965. Vegetational changes on a semidesert grassland range. Ecol. Monogr., 35:139-164. (N.M. Agr. Exp. Sta. Journ. Art. 215)

43 Bulloch, H.E. and R.E. Nehrer. 1980. Soil survey of Dona Ana County Area New Mexico. National Cooperative Soil Survey, U.S. Dep. Agr./Soil Cons. Serv., U.S. Govt. Prtg. Off. 291-913-5.

44 Caccamise, D.F. 1971. Competitive relationships of the Common and Lesser Nighthawk. Ph.D. Dissertation, New Mexico State Univ. 79 pp.

45 Caccamise, D.F. 1974. Competitive relationships of the Common and Lesser Nighthawks. Condor, 76:1-20.

46 Cadle, J.M. 1975. Factors affecting dystocia in range beef heifers. M.S. Thesis, New Mexico State Univ. 68 pp.

47 Campbell, R.S. 1929. Vegetative succession in the Prosopis sand dunes of southern New Mexico. Ecology, 10:392-398.

48 Campbell, R.S. 1929. A case of phyllody in Yucca elata. Bot. Gaz., 88:109-110.

49 Campbell, R.S. 1929. Conservative grazing, a paying policy. Cattleman, 16(4):31-33.

50 Campbell, R.S. 1929. Soapweed, N.M. Agr., 576:2.

51 Campbell, R.S. 1931. Plant succession and grazing capacity on clay soils in southern New Mexico. J. Agr. Resources, 43:1027-1051.

52 Campbell, R.S. 1935. After the drought. Amer. Cattle Prod., 17(1):3-5.

53 Campbell, R.S. 1935. Management of black grama ranges. Amer. Hereford J., 26(9):74-76.

54 Campbell, R.S. and E.H. Bomberger. 1934. The occurrence of Gutierrezia sarothrae on Bouteloua eriopoda ranges. Ecology, 15:49-61.

55 Campbell, R.S. and I.F. Campbell. 1938. Vegetation on gypsum soils of the Jornada plain, New Mexico. Ecology, 19:572-577.

56 Campbell, R.S. and E.C. Crafts. 1939. How to keep and increase black grama on southwestern ranges. U.S. Dep. Agr. Leafl., 180.

57 Campbell, R.S. and J.G. Keller. 1932. Growth and reproduction in Yucca elata. Ecology, 13:364-374.

58 Campbell, R.S. and J.G. Keller. 1933. Partial phyllody in Yucca elata. Bot. Gaz., 94:619-620.

59 Canfield, R.H. 1928. Atmospheric electricity during sand storms. Science, 69:474-475.

60 Canfield, R.H. 1933. Solid and hollow stemmed grasses of the Jornada Experimental Range. Science, 78:342.

61 Canfield, R.H. 1934. Stem structure of grasses on the Jornada Experimental Range. Bot. Gaz., 95:636-648.

62 Canfield, R.H. 1938. How closely may black grama and tobosa grass be grazed year after year? Cattleman, 23(7):1-3.

63 Canfield, R.H. 1939. The effect of intensity and frequency of clipping on density and yield of black grama and tobosa grass. U.S. Dep. Agr. Tech. Bull. 681.

64 Chinolla-Ruiz, O.S. 1977. Milk production of Hereford, Brangus and reciprocal crosses and its influence on the preweaning performance of calves. M.S. Thesis, New Mexico State Univ. 67 pp.

65 Cline, R.C. 1959. Relationship of weight of stocker calves and winter rations to pasture gains. M.S. Thesis, New Mexico State Univ. 36 pp.

66 Coleman, D.C. 1973. Comparative investigations in the U.S IBP grassland biome: decomposition section. 1973. US/IBP Grassland Biome Tech. Rep. 210. Colorado St. Univ., Ft. Collins.

67 Conley, M.R. 1982. Carrion locating efficiency in burying beetles, Nicrophorus carolinus (L.) (Silphidae). Southwest. Nat., 27:11-15. (N.M. Agr. Exp. Sta. Journ. Art. 813)

68 Coulibaly, M. 1980. Factors effecting production of Brangus under semi-desert conditions. M.S. Thesis, New Mexico State Univ. 78 pp.

69 Crafts, E.C. 1939. Height-volume distribution in range grasses. J. Forestry, 36:1182-1185.

70 Crawford, C.S. 1972. Water relations in a desert millipede Orthoporus ornatus (Girard) (Spirostreptidae). Comp. Biochem. Physiol., 42A:521-535.

71 Crawford, C.S. 1976. Feeding-season production in the desert millipede Orthoporus ornatus (Girard) (Diplopoda). Oecologia, 24:265-276.

72 Crawford, C.S. 1978. Seasonal water balance in Orthoporus ornatus, a desert millipede. Ecology 59:996-1004.

73 Crawford, C.S. and R.C. Wooten. 1973. Metabolic rates of millipedes in a desert ecosystem. US/IBP Desert Biome Res. Mem. 73-31. Utah State Univ., Logan.

74 Creusere, F.M. and W.G. Whitford. 1976. Ecological relationships in a desert anuran community. Herpetologica, 32:7-18.

75 Creusere, F.M. and W.G. Whitford. 1982. Temporal and spatial resource partitioning in a Chihuahuan desert lizard community. pp. 121-127, In Scott, N.J. (Ed.) Herpetological Communities. Wildlife Research Rep. 13. U.S. Fish & Wildl. Serv., Washington, D.C.

76 Cruz-Mendoza, J. 1975. Maternal traits in Brangus cattle. M.S. Thesis, New Mexico State Univ. 101 pp.

77 Cuesta, L.R. 1974. Comparative breeding ecology of the western kingbird in three habitat types. M.S. Thesis, New Mexico State Univ. 39 pp.

78 Culley, M.J. 1933. Values and limitations of clipped quadrats. Ecology, 14:35-39.

79 Cunningham, G.L. and J.H. Burk. 1973. The effects of carbonate deposition layers ("Caliche") on the water status of Larrea divaricata. Amer. Midl. Nat., 90:474-480.

80 Cunningham, G.L. and J.F. Reynolds. 1978. A simulation model of primary production and carbon allocation in the creosotebush (Larrea tridentata (DC) Cov.). Ecology, 59:37-52.

81 Cunningham, G.L. and J.P. Syvertsen. 1977. The effect of non-structural carbohydrate levels on dark CO2 release in creosotebush. Photosynthetica, 11:291-295.

82 Cunningham, G.L., F.R. Balding and J.P. Syvertsen. 1974. A net CO2 exchange model for C4-grasses. Photosynthetica, 8:28-33.

83 Cunningham, G.L., J.P. Syvertsen and T.V. Feather. 1975. Primary production and carbon allocation in creosotebush. US/IBP Desert Biome Res. Memo. 75-9. Utah St. Univ., Logan.

84 Cunningham, G.L., J.P. Syvertsen, J.F. Reynolds and J.M. Willson. 1979. Some effects of soil-moisture availability on above-ground production and reproductive allocation in Larrea tridentata (DC) Cov. Oecologia, 40:113-123.

85 Dabo, Sira-Mady. 1980. Botanical composition of black-tailed jackrabbit diets on a semidesert rangeland. M.S. Thesis, New Mexico State Univ. 85 pp.

86 Dabo, Sira-Mady, R.D. Pieper, R.F. Beck and G.M. Southward. 1982. Summer and fall diets of blacktailed jackrabbits on semidesert rangeland. N.M. Agr. Exp. Sta. Res. Rep. 476.

87 Darton, N.H. 1922. Geologic structure of parts of New Mexico. U.S. Geol. Surv. Bull. 726-E.

88 Darton, N.H. 1928. "Red Beds" and associated formations in New Mexico. U.S. Geol. Surv. Bull. 794, pp. 183-197, 324, 326, 339.

89 das Neves, A.P. 1974. Milk production of Hereford cows. M.S. Thesis, New Mexico State Univ. 45 pp.

90 das Neves, A., J.D. Wallace and C.H. Herbel. 1974. Milk production by Hereford cows. Proc. West. Sect., Amer. Soc. Anim. Sci., 25:310-311.

91 Davis, C.A. 1974. Mourning dove foods in semi-desert, south-central New Mexico. J. Wildl. Manage. 38(4):941-944. N.M. Agr. Exp. Sta. Journ. Art. 489

92 Delahunt, R.A. 1976. Summer activity cycles of Urosaurus ornatus in field and laboratory. M.S. Thesis, New Mexico State Univ. 30 pp.

93 Delesantro, M.C. 1978. The breeding ecology of the Black-throated Sparrow in southern New Mexico. M.S. Thesis, New Mexico State Univ. 43 pp.

94 Delson, J.H. 1974. The ecology of the desert dwelling salamander Ambystoma tigrinum. Ph.D. Dissertation, New Mexico State Univ. 68 pp.

95 Delson, J. and W.G. Whitford. 1973. Adaptation of the tiger salamander Ambystoma tigrinum, to arid habitats. Comp. Biochem. Physiol., 46A:631-638.

96 Delson, J. and W.G. Whitford. 1973. Critical thermal maxima in several life history stages in desert and montane populations of Ambystoma tigrinum. Herpetologica, 29:352-355.

97 Delson, R.K. 1975. Some reproductive aspects of three Chihuahuan desert Nyctaginaceae. M.S. Thesis, New Mexico State Univ. 42 pp.

98 deMiranda Leite, P.R. 1977. Milk production and composition, weight changes, and calf growth rate of Brangus, Hereford, and reciprocal crossbred cows under semidesert conditions. M.S. Thesis, New Mexico State Univ. 101 pp.

99 DePree, E.M. 1978. Energy allocation in desert winter annuals: test of the r- and k- selection theory. M.S. Thesis, New Mexico State Univ. 77 pp.

100 DePree, E. and J.A. Ludwig. 1978. Vegetative and reproductive growth patterns in desert willow (Chilopsis linearis (Cav.) Sweet). Southwest. Nat., 23:239-246.

101 Dittberner, P.L. 1971. A demographic study of some semidesert grassland plants. M.S. Thesis, New Mexico State Univ. 81 pp.

102 Duran, M.S. 1982. Patterns of prehistoric land use in Dona Ana County, New Mexico. Cultural Resources Manage. Div. Rep. 471. New Mexico State Univ. 229 pp.

103 Dwyer, D.D. 1972. Burning and nitrogen fertilization of tobosa grass. N.M. Agr. Exp. Sta. Bull. 595.

104 Edwards, J.W. 1975. Water balance and assimilation efficiency of the horned lizard, a field study. M.S. Thesis, New Mexico State Univ. 21 pp.

105 Elkins, N.Z. 1982. Potential mediation by desert subterranean termites in infiltration, runoff, and erosional soil loss on a desert watershed. Ph.D. Dissertation, New Mexico State Univ. 124 pp.

106 Elkins, N.Z., Y. Steinberger and W.G. Whitford. 1982. Factors affecting the applicability of the AET model for decomposition in arid environments. Ecology, 63:579-580.

107 Ellstrom, M.A. 1973. Populations and trophic structure of a desert grassland invertebrate community. M.S. Thesis, New Mexico State Univ. 100 pp.

108 Ellstrom, M.A. 1974. Invertebrate studies at the Jornada site, 1972. US/IBP Grassland and Biome Tech. Rep. 242. Colorado St. Univ., Ft. Collins.

109 Ellstrom, M.A. and J.G. Watts. 1974. Populations and trophic structure of a desert grassland invertebrate community. US/IBP Grassland Biome Tech. Rep. 248. Colorado St. Univ., Ft. Collins.

110 Engelking, C.T. 1969. The behavior of pronghorn-antelope in southcentral New Mexico. M.S. Thesis, New Mexico State Univ. 67 pp.

111 Ettershank, G. and W.G. Whitford. 1973. Oxygen consumption of two species of Pogonomyrmex harvester ants (Hymenoptera: Formicidae). Comp. Biochem. Physiol., 46A:605-611.

112 Ettershank, G., J.A. Ettershank and W.G. Whitford. 1980. Location of food sources by subterranean termites. Environ. Entomol., 9:645-648.

113 Ettershank, G., J. Ettershank, M. Bryant and W.G. Whitford. 1978. Effects of nitrogen fertilization on primary production in a Chihuahuan desert ecosystem. J. Arid Environ., 1:135-139.

114 Forsling, C.L. 1919. Chopped soapweed as emergency feed for cattle on southwestern ranges. U.S. Dep. Agr. Bull. 745.

115 Forsling, C.L. 1924. Saving livestock from starvation on southwestern ranges. U.S. Dep. Agr. Farmers' Bull. 1428.

116 Foster, L. and C.W. Humble. 1918. Range cow maintenance on yucca and sotol. N.M. Agr. Exp. Sta. Bull. 114.

117 Fowler, H.G. and W.G. Whitford. 1980. Termites, microarthropods and the decomposition of senescent and fresh creosotebush (Larrea tridentata) leaf litter. J. Arid Environ., 3:63-68.

118 Fowler, H.G. and W.G. Whitford. 1982. Floral visitation by Chihuahuan Desert ants. J. Nat. Hist., 16:879-881.

119 Francis, R.C. and M. Campion. 1972. Statistical analysis of intraseasonal herbage dynamics in a variety of grassland communities. US/IBP Grassland Biome Tech. Rep. 141. Colorado St. Univ., Ft. Collins.

120 Francis, R.C. and M.K. Campion. 1973. Separation of treatments within a plant community based on statistical analysis of plant structural dynamics. US/IBP Grassland Biome Preprint 65, Colorado St. Univ., Ft. Collins.

121 Gaby, R. 1972. Comparative niche utilization by two species of kangaroo rats. Ph.D. Dissertation, New Mexico State Univ. 71 pp.

122 Gadzia, K.L. 1979. Growth and development patterns of black grama in southern New Mexico. M.S. Thesis, New Mexico State Univ. 92 pp.

123 Gardner, J.L. 1951. Vegetation of the creostebush area of the Rio Grande Valley in New Mexico. Ecol. Mongr., 21:379-403.

124 Gerard, J.B. 1965. Factors and treatments affecting fruit fill, seed germination and seedling emergence of fourwing saltbush (Atriplex canescens (Pursh) Nutt.). M.S. Thesis, New Mexico State Univ. 60 pp.

125 Gerard, J.B. 1978. Factors affecting fruit fill and seed germination of fourwing saltbush (Atriplex canescens (Pursh) Nutt.) pp. 403-405, In Hyder, D.H. (Ed.) First Inter. Rangeland Conf., Soc. Range Manage., Vol. 1. (N.M. Agr. Exp. Sta. Journ. Art. 106).

126 Ghaly, M.Y. 1980. Pronghorn antelope studies on the Jornada del Muerto. M.S. Thesis, New Mexico State Univ. 50 pp.

127 Gile, L.H. 1961. A classification of Ca horizons in soils of a desert region, Dona Ana County, New Mexico. Soil Sci. Soc. Amer. Proc., 25:52-61.

128 Gile, L.H. 1966. Division S-5--soil genesis, morphology, and classification. Cambic and certain noncambic horizons in desert soils of southern New Mexico. Soil Sci. Soc. Amer., 30:773-781.

129 Gile, L.H. 1975. Causes of soil boundaries in an arid region: II. Dissection, moisture and faunal activity. Soil Sci. Soc. Amer. Proc., 39:324-330.

130 Gile, L.H. and R.B. Grossman. 1967. Morphology of the argillic horizon in desert soils of southern New Mexico. Soil Sci., 106:6-15.

131 Gile, L.H. and R.B. Grossman. 1979. The Desert Project Soil Monograph. U.S. Dept. Agr. and Soil Cons. Serv., U.S. Govt. Prtg. Off. 629-465, 1-3.

132 Gile, L.H., F.F. Peterson and R.B. Grossman. 1965. The K horizon: A master soil horizon of carbonate accumulation. Soil Sci., 69:74-82.

133 Gile, L.H., F.F. Peterson and R.B. Grossman. 1966. Morphological and genetic sequences of carbonate accumulation in desert soils. Soil Sci., 101:347-360.

134 Glidewell, E.D. 1970. Suitable habitat as a factor limiting pronghorn numbers on the Jornada Experimental Range. M.S. Thesis, New Mexico State Univ. 28 pp.

135 Gonzalez Rodriquez, J.K. 1977. Effects of range supplementation and season on botanical composition of cattle diets. M.S. Thesis, New Mexico State Univ. 41 pp.

136 Gonzalez Rodriquez, J.K., R.D. Pieper and G.S. Smith. 1978. Botanical composition of cattle diets on desert grassland range. N.M. Agr. Exp. Sta. Rep. 363.

137 Goodall, D.W., S. Childs and S. Morgan. 1972-74. Seed reserves in desert soils. US/IBP Desert Biome Res. Mem. 72-8, 73-5, 74-16. Utah St. Univ. Logan.

138 Gould, W.L. 1982. Wind erosion curtailed by controlling mesquite. J. Range Manage., 35:563-566. (N.M. Agr. Exp. Sta. Journ. Art. 825)

139 Grant, W.E. 1970. Comparisons of small mammal biomass at eight U.S. IBP Grassland Biome Research Sites, 1970 season. US/IBP Grassland Biome Abstracts. Colorado St. Univ., Ft. Collins.

140 Guiao, A. 1982. Behavior, nutritional status and body weight changes of cattle grazing improved and unimproved semiarid range in southern New Mexico. M.S. Thesis, New Mexico State Univ. 76 pp.

141 Hallett, J.G. 1982. Habitat selection and the community matrix of a desert small-mammal fauna. Ecology, 63(5):1400-1410.

142 Harding, E. 1976. Aerobic sporeforming bacteria in northern Chihuahuan desert soils. Ph.D. Dissertation, New Mexico State Univ. 101 pp.

143 Harrington, F.E. 1956. Effects of various environmental factors on the occurrence of cancer eye in Hereford cattle. M.S. Thesis, New Mexico State Univ. 18 pp.

144 Harris, L.D. 1971. An analysis of small mammal studies and results in the grassland biome. pp. 213-240, In French, N.R. (Ed.) Preliminary analysis of structure and function in grasslands. Range Sci. Dept. Sci. Ser. 10. Colorado State Univ., Ft. Collins.

145 Hawley, J.W. and F.E. Kottlowski. 1969. Quaternary geology of the south-central New Mexico border region. N.M. Bur. Mines and Min. Res. Circ. 104.

146 Head, M.L., G.S. Smith, P.A. Trujillo, C.H. Herbel and D. Sanson. 1982. Copper, manganese and zinc status of beef cows grazing dormant forage on arid range, as affected by supplement feeds. Proc. Wes. Sec. Amer. Soc. Anim. Sci., 33:239-241.

147 Heithold, D.W. 1980. Grazing behavior and diet composition of cattle on continuously and seasonally grazed semiarid ranges. M.S. Thesis, New Mexico State Univ. 50 pp.

148 Hennessy, J.T. 1981. Soil movement and vegetational changes over a forty-five year period in southcentral New Mexico. M.S. Thesis, New Mexico State Univ. 108 pp.

149 Hennessy, J.T. 1982. Mesquite (Prosopis glandulosa Torr.) dunes and interdunes in southern New Mexico: A study of water relations and plant production. Ph.D. Dissertation, New Mexico State Univ. 141 pp.

150 Hennessy, J.T., R.P. Gibbens, J.M. Tromble and M. Cardenas. 1983. Vegetation changes from 1935 to 1980 in mesquite dunelands and former grasslands of southern New Mexico. J. Range Manage., 36:370-374. (N.M. Agr. Exp. Sta. Journ. Art. 905)

151 Herbel, C.H. 1963. Fertilizing tobosa on flood plains in the semidesert grassland. J. Range Manage., 16:133-138. (N.M. Agr. Exp. Sta. Journ. Art. 188)

152 Herbel, C.H. 1964. Brush control. The Cattleman, 51(2):160.

153 Herbel, C.H. 1964. Jornada Experimental Range research. The Cattleman, 51(2):103.

154 Herbel, C.H. 1965. Research on improvement of brush infested grazing land on the Jornada Experimental Range. Mimeo 8 pp.

155 Herbel, C.H. 1971. A review of research related to development of grazing systems on native ranges of the western United States. U.S. Dep. Agr. Misc. Pub. 1271. (N.M. Agr. Exp. Sta. Journ. Art. 388)

156 Herbel, C.H. 1972. Using mechanical equipment to modify the seedling environment. U.S. Dep. Agr. Gen. Tech. Rep. INT-1, pp. 369-381. (N.M. Agr. Exp. Sta. Journ. Art. 389)

157 Herbel, C.H. 1972. Environmental modification for seedling establishment. Ch. 8, In Youngner, V. and C. McKell (Eds.). Biology and Utilization of grasses. Academic Press, New York.

158 Herbel, C.H. 1973. Some developments related to seeding western rangelands. pp. 75-80. In Wright, M.J. (Ed.). Range Research and Range Problems. Crop Sci. Soc. Amer. Pub. 3, Madison, WI.

159 Herbel, C.H. 1980. Manipulative range improvements-principals and practices. pp. 557-579 In Proc. Adv. Food Producing Sys. Arid Semi-Arid Lands, Kuwait.

160 Herbel, C.H. and F.N. Ares. 1961. A "two-gun" ground sprayer. Weeds, 9:656-57. (N.M. Agr. Exp. Sta. Journ. Art. 153)

161 Herbel, C.H. and L.H. Gile. 1973. Field moisture regimes and morphology of some arid-land soils in New Mexico. pp. 119-152, In Bruce, R.R., K.W. Flach and H.M. Taylor (Eds.) Field Soil Water Regimes. Soil Sci. Soc. Amer. Spec. Pub. 5, Madison, WI. (N.M. Agr. Exp. Sta. Journ. Art. 396)

162 Herbel, C.H. and W.L. Gould. 1970. Control of mesquite, creosotebush, and tarbush on arid rangelands of the southwestern United States. Proc. XI Int. Grassl. Cong. pp. 38-41. Surfers Paradise, Aust.

163 Herbel, C.H. and W.L. Gould. 1973. Improving arid rangelands. Jornada Exp. Range Rep. 4. 16 pp.

164 Herbel, C.H. and A.B. Nelson. 1966. Activities of Hereford and Santa Gertrudis cattle on a southern New Mexico range. J. Range Manage., 19:173-76. (N.M. Agr. Exp. Sta. Journ. Art. 237)

165 Herbel, C.H. and A.B. Nelson. 1966. Species preference of Hereford and Santa Gertrudis cattle on a southern New Mexico range. J. Range Manage., 19:177-181. (N.M. Agr. Exp. Journ. Art. 238)

166 Herbel, C.H. and A.B. Nelson. 1969. Grazing management on semidesert ranges in southern New Mexico. Jornada Exp. Range Rep. 1. 13 pp.

167 Herbel, C.H. and A.B. Nelson. 1974. Utilizing tobosa (Hilaria mutica (Buckl.) Benth) during the winter and spring. Proc. XII Int. Grassl. Cong. pp. 183-189, Moscow.

168 Herbel, C.H. and R.D. Pieper. 1970. Comprehensive network site description, Jornada. US/IBP Grassland Biome Tech. Rep. 43. Colorado State Univ., Ft. Collins.

169 Herbel, C.H. and R.E. Sosebee. 1969. Moisture and temperature effects on emergence and initial growth of two range grasses. Agron. J., 61:628-631. (N.M. Agr. Exp. Sta. Journ. Art. 308)

170 Herbel C., F. Ares and J. Bridges. 1958. Hand-grubbing mesquite in the semidesert grassland. J. Range Manage., 11:267-270.

171 Herbel, C.H., F.N. Ares and A.B. Nelson. 1967. Grazing distribution patterns of Hereford and Santa Gertrudis cattle on a southern New Mexico range. J. Range Manage., 20:296-98. (N.M. Agr. Exp. Sta. Journ. Art. 279)

172 Herbel, C.H., F.N. Ares and R.A. Wright. 1972. Drought effects on a semi-desert range. Ecology, 53:1084-93. (N.M. Agr. Exp. Sta. Journ. Art. 232)

173 Herbel, C.H., P.L. Dittberner and T.S. Bickle. 1970. A quantitative ecology of the Jornada Experimental Range. pp. 133-177, In Wright, R.G. and G.M. Van Dyne (Eds.). Simulation and Analysis of Dynamics of a Semi-Desert Grassland. Sci. Ser. 6, Range Sci. Dept., Colorado State Univ., Ft. Collins.

174 Herbel, C.H., R.P. Gibbens and J.M. Tromble. 1977. Improving production from arid rangelands of the southwestern United States. pp. 625-628, In Proc. XIII Int. Grassl. Cong., Leipzig, Germany.

175 Herbel, C.H., R. Steger and W.L. Gould. 1974. Managing semidesert ranges of the southwest. N.M. Ext. Sta. Circ. 465.

176 Herbel, C.H., G.H. Abernathy, C.C. Yarbrough and D.K. Gardner. 1973. Rootplowing and seeding arid rangelands in the southwest. J. Range Manage., 26:193-197. (N.M. Agr. Exp. Sta. Journ. Art. 418)

177 Herbel, C.H., W.L. Gould, W.F. Leifeste and R.P. Gibbens. 1983. Herbicide treatment and vegetation response to treatment of mesquites in southern New Mexico. J. Range Manage., 36:149-151. (N.M. Agr. Exp. Sta. Journ. Art. 907)

178 Herrick, C.L. 1900. The geology of the White Sands of New Mexico. J. Geol., 7:112-128.

179 Hickman, G.W. 1974. Some effects of a carbamate insecticide on primary producers in a desert grassland ecosystem. M.S. Thesis, New Mexico State Univ. 24 pp.

180 Hill, K.R. 1965. Estimated intake and nutritive value of range forage grazed by Hereford and Santa Gertrudis cows. M.S. Thesis, New Mexico State Univ. 33 pp.

181 Hills, J.M. 1968. Intake and digestability of range forage by Hereford and Santa Gertrudis cows. M.s. Thesis, New Mexico State Univ. 61 pp.

182 Hoover, K.D. 1973. Some ecological factors influencing the distribution of two species of pocket mice. Ph.D. Dissertation, New Mexico State Univ. 81 pp.

183 Hoover, K.D., W.G. Whitford and P. Flavill. 1977. Factors influencing the distributions of two species of Perognathus. Ecology, 58:877-884.

184 Howard, V.W., C.T. Engelking, E.D. Glidewell and J.E. Wood. 1973. Factors restricting pronghorn increase on the Jornada Experimental Range. N.M. Agr. Exp. Sta. Res. Rep. 245.

185 Ibarra, Gil H. 1975. Grazing effects on a desert grassland. M.S. Thesis, New Mexico State Univ. 37 pp.

186 Jardine, J.T. and C.L. Forsling. 1922. Range and cattle management during drought. U.S. Dep. Agr. Bull. 1031.

187 Jardine, J.T. and L.C. Hurtt. 1917. Increase cattle production on southwestern ranges. U.S. Dep. Agr. Bull. 588.

188 Jeffcoat, B.L. 1980. Factors affecting seed germination and seedling establishment of broom snakeweed. M.S. Thesis, New Mexico State Univ. 101 pp.

189 Johnson, K.A. and W.G. Whitford. 1975. Foraging ecology and relative importance of subterranean termites in Chihuahuan desert ecosystems. Environ. Entomol., 41:66-70.

190 Jornada staff. 1975. Publications of the Jornada Experimental Range. Jornada Exp. Range Rep. 5. 8 pp.

191 Jornada staff. 1980. The Jornada Experimental Range, Las Cruces, New Mexico. U.S. Dep. Agr., Govt. Prtg. Off. 689-479.

192 Kay, C.A. 1974. Aspects of the thermal physiology of honey ants. Ph.D. Dissertation, New Mexico State Univ. 74 pp.

193 Kay, C.A. and W.G. Whitford. 1975. Influences of temperature and humidity on oxygen consumption of five Chihuahuan desert ants. Comp. Biochem. Physiol., 52A:281-286.

194 Kay, C.A. and W.G. Whitford. 1978. Critical thermal limits of desert honey ants: possible ecological implications. Physiol. Zool., 51(2):206-213.

195 Kay, F.R. 1974. Influence of the burrow environment on body temperature, oxygen consumption and water loss of the banner-tailed kangaroo rat. Ph.D. Dissertation, New Mexico State Univ. 99 pp.

196 Kay, F.R. and W.G. Whitford. 1978. Burrow environment of the banner-tailed kangaroo rat, Dipodomys spectabilis, in south-central New Mexico. Amer. Midl. Nat., 99:270-279.

197 Keyes, C.R. 1905. Geology and underground water conditions of the Jornada del Muerto, New Mexico. U.S. Geol. Surv. Water Supply Paper 123.

198 Kiesling, H.E. 1968. Intake and digestibility of tobosa (Hilaria mutica) by grazing steers. M.S. Thesis, New Mexico State Univ. 91 pp.

199 Kiesling, H.E., A.B. Nelson and C.H. Herbel. 1969. Chemical composition of tobosa grass collected by hand-plucking and esophageal-fistulated steers. J. Range Manage., 22:155-59. (N.M. Agr. Exp. Sta. Journ. Art. 306)

200 Kiesling, H.E., H.A. Barry, A.B. Nelson and C.H. Herbel. 1969. Recovery of chromic oxide administered in paper to grazing steers. J. Anim. Sci., 29(2):361-364. (N.M. Agr. Exp. Sta. Journ. Art. 315)

201 King, W.E., J.W. Hawley, A.M. Taylor and R.P. Wilson. 1971. Geology and ground-water resources of central and western Dona Ana County, New Mexico. Bur. Mines and Min. Res.

202 Kinzer, H.G. 1969. Aerial applications of ultra-low-volume insecticides to control the horn fly on unrestrained range cattle. J. Econ. Entomol., 62:1515-1516. (N.M. Agr. Exp. Sta. Journ. Art. 323)

203 Kinzer, H.G. and J.M. Reeves. 1974. Dispersal and host location of the horn fly. Environ. Entomol., 3(1):107-111. (N.M. Agr. Exp. Sta. Jour. Art. 479)

204 Kinzer, H.G., J.M. Reeves and J.W. Atmar. 1978. Host location by the horn fly: field evaluation of an artificial device for measuring attraction to various stimuli. Environ. Entomol., 7:375-378. (N.M. Agr. Exp. Sta. Journ. Art. 646)

205 Klemmedson, J.O. and R. Barth. 1972-73-74. Distribution and balance of biomass and nutrients in a desert shrub ecosystem. US/IBP Desert Biome Res. Mem. 72-14,73-8,74-6. Utah St. Univ., Logan.

206 Knipe, D. and C.H. Herbel. 1960. The effects of limited moisture on germination and initial growth of six grass species. J. Range Manage., 13:297-302. (N.M. Agr. Exp. Sta. Journ. Art. 150)

207 Knipe, D. and C.H. Herbel. 1966. Germination and growth of some semidesert grassland species treated with aqueous extract from creosotebush. Ecology, 47:775-81.

208 Knipe, O.D. 1960. The effects of aqueous extracts of creosotebush on germination and growth of some desert plains grassland plants. M.S. Thesis, New Mexico State Univ. 56 pp.

209 Knox, J.H. and M. Koger. 1946. A comparison of gains and carcasses produced by three types of feeder steers. J. Anim. Sci., 5:331-337. (N.M. Agr. Exp. Sta. Journ. Art. 40)

210 Knox, J.H. and P.E. Neale. 1937. Mineral supplements for cattle on phosphorus-deficient range. N.M. Agr. Exp. Sta. Bull. 249.

211 Knox, J.H. and W.E. Watkins. 1942. The use of phosphorus and calcium supplements for range livestock in New Mexico. N.M. Agr. Exp. Sta. Bull. 287.

212 Knox, J.H. and W.E. Watkins. 1958. Supplements for range cows. N.M. Agr. Exp. Sta. Bull. 425

213 Knox, J.H., J.W. Benner and W.E. Watkins. 1941. Seasonal calcium and phosphorous requirements of range cattle as shown by blood analysis. N.M. Agr. Exp. Sta. Bull. 282.

214 Knox, J.H., J.W. Benner and W.E. Watkins. 1946. Seasonal feeding of mineral supplements. N.M. Agr. Exp. Sta. Bull. 331.

215 Knox, J.H., W.E. Watkins, M. Koger and K.A. Valentine. 1951. Research on the College Ranch. N.M. Agr. Exp. Sta. Bull. 359.

216 Koger, M. and J.H. Knox. 1945. The effect of sex on weaning weight of range calves. J. Anim. Sci., 4:15-19. (N.M. Agr. Exp. Sta. Journ. Art. 31)

217 Koger, M. and J.H. Knox. 1945. A method of estimating weaning weights of range calves at a constant age. J. Anim. Sci., 4:285-290. (N.M Agr. Exp. Sta. Journ. Art. 34)

218 Koger, M. and J.H. Knox. 1947. The repeatability of the yearly production of range cows. J. Anim. Sci., 6:461-466. (N.M. Agr. Exp. Sta. Journ. Art. 41)

219 Koger, M. and J.H. Knox. 1951. The correlation between gains made at different periods by cattle. J. Anim. Sci., 10:760-763. (N.M. Agr. Exp. Sta. Journ. Art. 67)

220 Koger, M. and J.D. Mankin. 1952. Heritability of intensity of red color in Hereford cattle. J. Heredity, 63:15-17. (N.M. Agr. Exp. Sta. Journ. Art. 69)

221 Korzdorfer, E.J. 1968. Seeding, furrowing, brush removal, and rabbit exclusion effects on creosotebush infested sites. M.S. Thesis, New Mexico State Univ. 54 pp.

222 Kottlowski, F.E., R.H. Flower, M.L. Thompson and R.W. Foster. 1956. Stratigraphic studies of the San Andres Mountains, New Mexico. N.M. Bur. Mines and Min. Res. Memo. 1.

223 Lane, J.D. 1962. The reproductive cycle of Dipodomys ordii and Dipodomys merriami in southern New Mexico. M.S. Thesis, New Mexico State Univ. 28 pp.

224 Lantow, J.L. 1929. The poisoning of livestock by Drymaria pachyphylla. N.M. Agr. Exp. Sta. Bull. 173.

225 Lantow, J.L. 1930. Supplemental feeding of range cattle. N.M. Agr. Exp. Sta. Bull. 185.

226 Lantow, J.L. 1933. The assimilations of calcium and phosphorous from different mineral compounds and their effect on range cattle. N.M. Agr. Exp. Sta. Bull. 214.

227 Law, L.W. 1968. Ecotypic variation in seed and seedling characteristics in New Mexico galleta grass. M.S. Thesis, New Mexico State Univ. 33 pp.

228 Lewis, J.K. 1970. Primary producers in grassland ecosystems. pp. 241-1-241-87, In Dix, R.L. and R.G. Beidleman (Eds.) The Grassland Ecosystem: A Preliminary Synthesis. Range Sci. Dept. Sci. Ser. 2 (Supplement). Colorado State Univ., Ft. Collins.

229 Lewis, J.K. 1971. The Grassland Biome: A synthesis of structure and function, 1970. pp. 317-387, In French, N.R. (Ed.) Preliminary analysis of structure and function in grasslands. Range Sci. Dept. Sci. Ser. 10. Colorado State Univ., Ft. Collins.

230 Little, E.L. 1937. Bryophytes of the Jornada Experimental Range, New Mexico. Bryologist, 40:81-83.

231 Little, E.L. 1937. A study of poisonous drymaria on southern New Mexico ranges. Ecology, 18:416-26.

232 Little, E.L. and R.S. Campbell. 1943. Flora of Jornada Experimental Range, New Mexico. Amer. Midl. Nat., 30:626-70.

233 Little, E.L. and J.G. Keller. 1937. Amphibians and reptiles of Jornada Experimental Range, New Mexico. Copeia, 4:216-22.

234 Little, E.O. 1934. American egrets at the Jornada Experimental Range, NM. Condor, 36:247.

235 Little, E.O. 1936. Poisonous drymaria on ranges of southern New Mexico. West. Livestock, 21(16):1,4.

236 Lohmiller, R.G. 1963. Drought and its effect on condition and production of a desert grassland range. M.S. Thesis, New Mexico State Univ. 57 pp.

237 Lopez de Torre, G. 1976. Growth patterns of Hereford and Brangus cows under two different environments. M.S. Thesis, New Mexico State Univ. 70 pp.

238 Lopez de Torre, G. and B.J. Rankin. 1978. Factors affecting growth curve parameters of Hereford and Brangus cows. J. Anim. Sci., 46:604-613. (N.M. Agr. Exp. Sta. Journ. Art. 618)

239 Ludwig, J.A. 1977. Distributional adaptation of root systems in desert environments. In Marshall, J.K. (Ed.) The Belowground Symposium: A Synthesis of Plant-Associated Processes. Range Sci. Dept. Sci. Ser. No. 26, Colorado State Univ., Ft. Collins.

240 Ludwig, J.A. and P. Flavill. 1979. Productivity patterns of Larrea in the northern Chihuahuan desert. pp. 139-150, In Lopez, E.C., T.J. Mabry and S.F. Tavizor (Eds.) Larrea Centro de Investigacion en quimica aplicada. Comision Nacional de las Zonas Anos, Saltillo, Coahuila, Mexico.

241 Ludwig, J.A. and W.G. Whitford. 1981. Short-term water and energy flow in arid ecosystems. pp. 271-299, In Noy-Meir, I. (Ed.) Arid Ecosystem Dynamics. Vol.II. Inter IBP Synthesis Series, Cambridge Univ. Press, NY.

242 Ludwig, J.A., J.F. Reynolds and P.D. Whitson. 1975. Size-biomass relationships of several Chihuahuan desert shrubs. Amer. Midl. Nat., 94:451-461.

243 Lynn, R.I. and R.E. Cameron. 1972. The role of algae in crust formation and nitrogen cycling in desert soils. US/IBP Desert Biome Res. Mem. 72-43. Utah St. Univ., Logan.

244 Marcy, R.B. 1850. Report on a route from Fort Smith to Santa Fe. 31st Congress of the United States Sen. Ex. Doc. 64. 197-198.

245 McCleery, N.B. 1954. The effects of mild inbreeding on weaning weight and grade of Hereford cattle. M.S. Thesis, New Mexico State Univ. 29 pp.

246 McDaniel, B. 1971. The role of invertebrates in the grassland biome. pp. 267-316, In French, N.R. (Ed.) Preliminary analysis of structure and function in grasslands. Range Sci. Dept. Sci. Ser. 10. Colorado State Univ., Ft. Collins.

247 McDaniel, K.C. and E.W. Huddleston. 1981. Rangeland Improvements for New Mexico, 1976 to 1981. N.M. Agr. Exp. Sta. Spec. Rep. 41.

248 McKinney, H.H. 1975. Reproductive effort in some Chihuahuan desert annuals. M.S. Thesis, New Mexico State Univ.

249 Maker, H.J., R.H. Nehrer, P.H. Derr and J.U. Anderson. 1971. Soil associations and land classification for irrigation in Dona Ana County. N.M. Agr. Exp. Sta. Res. Rep. 183.

250 Malm, N.R. and F.E. Houghton. 1977. Climatic guide, Las Cruces, 1851-1976. N.M. Agr. Exp. Sta. Res. Rep. 350.

251 Meltzer, K.H. 1973. Physiological and ecological aspects of aestivation of recently metamorphosed desert anurans. M.S. Thesis, New Mexico State Univ.

252 Miles, N.J. 1979. Host specificity in the yucca moth, Tegeticula yuccasella complex: A morphometric approach. M.S. Thesis, New Mexico State Univ. 48 pp.

253 Miller, M.M. 1983. An analysis of activity patterns in the grasshopper mouse (Onychomys leucogaster): abiotic factors as predictive variables. M.S. Thesis, New Mexico State Univ. 24 pp.

254 Miller, R.F. 1976. Response of five southwestern range plants to season of defoliation. Ph.D. Dissertation, New Mexico State Univ. 104 pp.

255 Miller, R.F. and G.B. Donart. 1979. Response of Bouteloua eriopoda (Torr.) Torr. and Sporobolus flexuosus (Thurb.) Rybd. to season of defoliation. J. Range Manage., 32:63-67. (N.M. Agr. Exp. Sta. Journ. Art. 665)

256 Miller, R.F. and G.B. Donart. 1981. Response of Muhlenbergia porteri Scribn. to season of defoliation. J. Range Manage., 34:91-94. (N.M. Agr. Exp. Sta. Journ. Art. 747)

257 Moroka, D.N. 1979. Impact of burrowing activity of the banner-tailed kangaroo rat on Southern New Mexico desert rangelands. M.S. Thesis, New Mexico State Univ. 37 pp.

258 Moroka, N., R.F. Beck and R.D. Pieper. 1982. Impact of burrowing activity of the banner-tail kangaroo rat on southern New Mexico desert rangelands. J. Range Manage., 35:707-710. (N.M. Agr. Exp. Sta. Journ. Art. 887)

259 Musa, Y. 1976. The effects of grazing on vine mesquite (Panicum obtusum H.B.K.). M.S. Thesis, New Mexico State Univ. 37 pp.

260 Nadabo, S.I. 1978. Growth patterns of broom snakeweed (Xanthocephalum sarothrae (Pursh) Shinners). M.S. Thesis, New Mexico State Univ. 67 pp.

261 Nadabo, S., R.D. Pieper and R.F. Beck. 1980. Growth patterns and biomass relations of Xanthocephalum sarothrae (Prush) shinners on sandy soils in southern New Mexico. J. Range Manage., 33:394-397. (N.M. Agr. Exp. Sta. Journ. Art. 753)

262 Nava, G. 1970. Occurrence of vegetation and emergence of species from surface soil collected on two southwestern desert range sites. M.S. Thesis, New Mexico State Univ. 30 pp.

263 Nelson, A.B. and C.H. Herbel. 1966. Activities and species preference of Hereford and Santa Gertrudis range cows. Proc. Wes. Sec., Amer. Soc. Anim. Sci., 17:403-408.

264 Nelson, A.B. and C.H. Herbel. 1967. Blood composition of range beef cows. Proc. West. Sec., Amer. Soc. Anim. Sci., 18:177-182.

265 Nelson, A.B., C.H. Herbel and H.M. Jackson. 1969. Chemical composition of the diet of cows grazing on arid range. Proc. Wes. Sec. Amer. Soc. Anim. Sci., 20:355-360.

266 Nelson, A.B., C.H. Herbel and H.M. Jackson. 1970. Chemical composition of forage species grazed by cattle on an arid New Mexico range. N.M. Agr. Exp. Sta. Bull. 561.

267 Nelson, A.B., L.A. Holland and C.H. Herbel. 1969. Performance of Hereford and Santa Gertrudis cattle on an arid New Mexico range. Jornada Exp. Range Rep. 2, 15 pp.

268 Nelson, A.B., A.L. Neumann, C.H. Herbel, C.C. Yarbrough, E.E. Parker and J. Whittenburg. 1971. Liquid and dry supplements for wintering range beef calves. N.M. Agr. Exp. Sta. Res. Rep. 214.

269 Nelson, E.W. 1922. Calf crop increases on the Jornada. Organ. Farm., 3(3):1-2,21.

270 Nelson, E.W. 1934. The influence of precipitation and grazing on black grama range. U.S. Dep. Agr. Tech. Bull. 409.

271 Neville, S.P. 1973. Carcass performance of Brangus, Hereford and reciprocally crossbred steers. M.S. Thesis, New Mexico State Univ. 43 pp.

272 New Mexico Agricultural Experiment Station staff. 1912-present. Annual Report Series. N.M. Agr. Exp. Sta., Las Cruces, N.M.

273 New Mexico Agricultural Experiment Station staff. 1938-1956. Ranch Day. Jornada Experimental Range and New Mexico State College Ranch. Mimeo. N.M. Agr. Exp. Sta., Las Cruces, N.M.

274 Norris, J.J. 1950. Effects of rodents, rabbits, and cattle on two vegetation types in semi-desert range land. N.M. Agr. Exp. Sta. Bull. 353.

275 Norris, J.J., K.A. Valentine and J.B. Gerard. 1963. Mesquite control with monuron, fenuron, and diuron. N.M. Agr. Expt. Sta. Bull 484.

276 O'Brien, R.T. 1972. Proteolytic activity of soil microorganisms. US/IBP Desert Biome Res. Mem. 72-42. Utah St. Univ., Logan.

277 O'Laughlin, T.C. 1975. The distribution and productivity of Flourensia cernua D.C. (tarbush) in southern New Mexico. M.S. Thesis, New Mexico State Univ. 74 pp.

278 Osman, A.A. 1982. Establishment of broom snakeweed (Xanthocephalum sarothrae) (Pursh) Shinners and other species on semidesert grasslands of Southern New Mexico. Ph.D. Dissertation, New Mexico State Univ.

279 Packard, R.L. 1971. Small mammals on Jornada and Pantex sites, 1970-1971. US/IBP Grassland Biome Tech. Rep. 188. Colorado St. Univ., Ft. Collins.

280 Parker, E.E. 1963. Estimating grass herbage production on desert plains grassland range. M.S. Thesis, New Mexico State Univ. 37 pp.

281 Parker, K.W. 1942. Noxious range plants as soil robbers. Amer. Hereford J., 32(17):118-119.

282 Parker, K.W. 1943. Control of mesquite on southwestern ranges. U.S. Dep. Agr. Leafl. 234.

283 Parker, K.W. 1949. Control of noxious range plants in a range management program. J. Range Manage., 2:128-32.

284 Parker, L.W., H. Fowler, G. Ettershank and W.G. Whitford. 1982. The effects of subterranean termite removal on desert soil-nitrogen and ephemeral flora. J. Arid Environ., 5:53-59.

285 Parker, L.W., J. Miller, V. Steinberger and W.G. Whitford. 1983. Soil respiration in a Chihuahuan Desert rangeland. Soil Biol. Biochem., 15:303-309.

286 Paulsen, H.A.,Jr. and F.N. Ares. 1961. Trends in carrying capacity and vegetation on an arid southwestern range. J. Range Manage., 14:78-83.

287 Paulsen, H.A.,Jr. and F.N. Ares. 1962. Grazing values and management of black grama and tobosa grasslands and associated shrub ranges of the southwest. U.S. Dept. Agr. Tech. Bull. 1270. 56 pp.

288 Pearse, C.K. 1950. Rotation grazing on the Jornada and Santa Rita ranges. J. Range Manage., 3:226.

289 Pieper, R.D. and C.H. Herbel. 1974. Primary production on the Jornada site for 1972. US/IBP Grassland Biome Tech. Rep. 249. Colorado St. Univ., Ft. Collins.

290 Pieper, R.D. and C.H. Herbel. 1982. Herbage dynamics and primary productivity of a desert grassland ecosystem. N.M. Agr. Exp. Sta. Bull. 695.

291 Pieper, R.D., M. Cannaughton and R. Fitzenrider. 1970. Preliminary report on sampling of primary producers, invertebrates, and decomposers on the Jornada site, 1970. US/IBP Grassland Biome Tech. Rep. 105. Colorado St. Univ., Ft. Collins.

292 Pieper, R.D., M.A. Ellstrom, E.E. Staffeldt and R.J. Raitt. 1971. Primary producers, invertebrates, birds, and decomposers on the Jornada site, 1971. US/IBP Grassland Biome Tech. Rep. 200. Colorado St. Univ., Ft. Collins.

293 Pieper, R.D., C.H. Herbel, D.D. Dwyer and R.E. Banner. 1974. Management implication of herbage weight changes on native rangeland. J. Soil Water Conserv., 29:227-229. (N.M. Agr. Exp. Sta. Journ. Art. 496)

294 Pimm, S.L. 1974. Community process and structure. Ph.D. Dissertation, New Mexico State Univ. 91 pp

295 Pino, R. 1954. Comparative efficiency of various lengths of belt transects in estimating forage production on semidesert grassland range. M.S. Thesis, New Mexico State Univ. 32 pp.

296 Prieto, A.A. 1967. Physiological responses to temperature in horned lizards. M.S. Thesis, New Mexico State Univ. 25 pp.

297 Prieto, A.A. and W.G. Whitford. 1971. Physiological responses to temperature in the horned lizards, Phrynosoma cornutum and Phrynosoma douglassi. Copeia, 1971:489-504.

298 Prieto, A.E. 1968. Vitamin A injections for range beef cows. M.S. Thesis, New Mexico State Univ. 50 pp.

299 Raitt, R.J. and S.L. Pimm. 1972. Jornada Bird Censuses, 1972. US/IBP Grassland Biome Tech. Rep. No. 271. Colorado State Univ., Ft. Collins.

300 Raitt, R.J. and S.L. Pimm. 1976. Dynamics of bird communities in the Chihuahuan Desert, New Mexico. Condor, 78:427-442.

301 Rankin, B.J. and C. Torres-Hernandez. 1978. Factors affecting fall weights of Brangus and Hereford cows in southern New Mexico. N.M. Agr. Exp. Sta. Res. Rep. 366.

302 Rankin, B.J., S.M. Shaffer, S.P. Neville and L.A. Holland. 1978. Crossbreeding Hereford and Brangus cattle in varied southwestern environments. N.M. Ag. Exp. Sta. Bull. 661.

303 Rasmussen, J.L. 1971. Abiotic factors in grassland ecosystem analysis and function. pp. 11-34, In French, N.R. (Ed.) Preliminary analysis of structure and function in grasslands. Range Sci. Dept. Sci. Ser. 10. Colorado State Univ., Ft. Collins.

304 Rebar, C.E. 1980. Interactions in microhabitat use between Dipodomys ordii and Onychomys leucogaster. M.S. Thesis, New Mexico State Univ. 41 pp.

305 Rebar, C. and W. Conley. 1983. Interactions in microhabitat use between Dipodomys ordii and Onychomys leucogaster. Ecology, 64(5):984-988.

306 Redding, P.D. 1967. Growth and propagation potential of selected New Mexico native plants for commercial use, M.S. Thesis, New Mexico State Univ. 28 pp.

307 Reitzel, J.A. 1982. The effects of brush control on bird populations in a mesquite community. M.S. Thesis, New Mexico State Univ. 55 pp.

308 Repp, W.W. and W.E. Watkins. 1958. Carotene, vitamin A, and inorganic phosphorus in the blood plasma of range cows. N.M. Agr. Exp. Sta. Bull. 420.

309 Reuss, J.O. 1971. Soils of the Grassland Biome Sites pp. 35-40, In French, N.R. (Ed.) Preliminary analysis of structure and function in grasslands. Range Sci. Dept. Sci. Ser. 10. Colorado State Univ., Ft. Collins.

310 Reuss, J.O. 1971. Decomposer and nutrient cycling investigations in the Grassland Biome. pp. 133-146, In French, N.R. (Ed.) Preliminary analysis of structure and function in grasslands. Range Sci. Dept. Sci. Ser. 10. Colorado State Univ., Ft. Collins.

311 Reynolds, J.F. 1974. A comparative modeling study of plant growth systems in a desert ecosystem. Ph.D. Dissertation, New Mexico State Univ. 68 pp.

312 Reynolds, J.F. and G.L. Cunningham. 1981. Validation of primary production model of the desert shrub Larria tridentata using soil moisture augmentation experiments. Oecologia, 51:357-363.

313 Reynolds, J.F., G.L. Cunningham and J.P. Syvertsen. 1979. A net CO2 exchange model for Larrea tridentata. Photosynthetica, 13:270-286.

314 Richards, S.G. 1979. Milk production, weight changes and preweaning growth rate of Brangus Hereford, and reciprocal crossbred cows under semidesert conditions. M.S. Thesis, New Mexico State Univ. 63 pp.

315 Richman, D.B., E.W. Huddleston and M. Ortiz. 1982. Seasonal activity of tenebrionid beetles in New Mexico mesquite dunes. Southwest. Nat., 27(3):305-308.

316 Risser, P.G. 1971. Plant community structure. pp. 41-58. In French, N.R. (Ed.) Preliminary analysis of structure and function in grasslands. Range Sci. Dept. Sci. Ser. 10. Colorado State Univ., Ft. Collins.

317 Risser, P.G. 1972. Preliminary producer data synthesis, 1970, Comprehensive Network Sites. US/IBP Grassland Biome Tech. Rep. 161. Colorado St. Univ., Ft. Collins.

318 Rogers, J.G. 1965. Analysis of the coyote population of Dona Ana County, New Mexico. M.S. Thesis, New Mexico State Univ. 39 pp.

319 Romo, A. 1954. Phenotypic and genetic relationships between type and weight of range cattle at different periods. M.S. Thesis, New Mexico State Univ. 27 pp.

320 Rosiere, R.E. 1973. Cattle diets on semidesert grassland. M.S. Thesis, New Mexico State Univ. 139 pp.

321 Rosiere, R.E., R.F. Beck and J.D. Wallace. 1975. Cattle diets on semidesert grassland: Botanical composition. J. Range Manage., 28:89-93. (N.M. Agr. Exp. Sta. Journ. Art. 517)

322 Rosiere, R.E., J.D. Wallace and R.F. Beck. 1975. Cattle diets on semidesert grassland: nutritive content. J. Range Manage., 28:94-96. (N.M. Agr. Exp. Sta. Journ. Art. 519)

323 Roth, T.E. 1983. Response of three species of globemallow to germination treatments. M.S. Thesis, New Mexico State Univ. 55 pp.

324 Ruhe, R.V. 1967. Geomorphic surfaces and surficial deposits in southern New mexico. N.M. Bur. Mines and Min. Res. Memo. 18.

325 Russell, J.W. 1973. Soil-plant-livestock-weather relationships of a range ecosystem: interactive timeshare regression and simulation model approaches. M.S. Thesis, New Mexico State Univ. 94 pp.

326 Ryder-White, J.A. 1980. Microbial activity of a semidesert rangeland as affected by 2, 4, 5-T. M.S. Thesis, New Mexico State Univ. 69 pp.

327 Sanderson, S.H. 1980. Creosotebush seed production and viability following herbicide treatment. M.S. Thesis, New Mexico State Univ. 49 pp.

328 Santos, P.F. 1979. The role of microarthropods and nematodes in litter decomposition in a Chihuahuan Desert ecosystem. Ph.D. Dissertation, New Mexico State Univ. 82 pp.

329 Santos, P.F. and W.G. Whitford. 1981. The effects of microarthropods on litter decomposition in a Chihuahuan Desert ecosystem. Ecology, 62:654-663.

330 Santos, P.F. and W.G. Whitford. 1981. Litter decomposition in the desert. Bioscience, 31(2):145-146.

331 Santos, P.F., E. DePree and W.G. Whitford. 1978. Spatial distribution of litter and microarthropods in a Chihuahuan Desert ecosystem. J. Arid Environ., 1:41-48.

332 Santos, P.F., J. Phillips and W.G. Whitford. 1981. The role of mites and nematodes in early stages of buried litter decomposition in a desert. Ecology, 62:664-669.

333 Schaefer, D.A. 1980. Nutrient cycling by the subterranean termite on a desert bajada. M.S. Thesis, New Mexico State Univ. 68 pp.

334 Schaefer, D.A. and W.G. Whitford. 1981. Nutrient cycling by the subterranean termite in a Chihuahuan Desert ecosystem. Oecologia, 48:277-283.

335 Schumacher, A. and W.G. Whitford. 1975. The foraging ecology of two species of Chihuahuan desert ants: Formica perpilosa and Trachymyrmex smithi neomexicanus (Hymenoptera: Formicidae). Ins. Soc., 21:317-330.

336 Schumacher, A. and W.G. Whitford. 1976. Spatial and temporal variation in Chihuahuan Desert ant faunas. Southwest. Nat., 21:1-8.

337 Sciacca, C.E. 1963. Heritabilities and correlations between traits in Hereford steers. M.S. Thesis, New Mexico State Univ. 75 pp.

338 Shafer, S.M. 1973. An evaluation of feedlot performance of Brangus, Hereford, and reciprocal crossbred steers. M.S. Thesis, New Mexico State Univ. 47 pp.

339 Shaffer, D.T. 1979. Behavioral responses of a predator, the round-tailed horned lizard and its prey, honey-pot ants. M.S. Thesis, New Mexico State Univ. 27 pp.

340 Shaffer, D.T. and W.G. Whitford. 1981. Behavioral responses of a predator, the round-tailed horned lizard, Phrynosoma modestum and its prey, honey pot ants, Myrmecocystus spp. Amer. Midl. Nat., 105:209-215.

341 Shumard, G.G. 1858. Structure of the Jornada del Muerto. Trans St. Louis Acad. Sci., 1:341.

342 Sims, P.L. and J.S. Singh. 1971. Herbage dynamics and net primary production in certain ungrazed and grazed grasslands of North America. pp. 59-124, In French, N.R. (Ed.) Preliminary analysis of structure and function in grasslands. Range Sci. Dept. Sci. Ser. 10. Colorado State Univ., Ft. Collins.

343 Siriphant, C. 1971. The relationship of organic carbon content to carbonate and soluble Ca and Mg content in some New Mexico soils. M.S. Thesis, New Mexico State Univ. 65 pp.

344 Smith, S.D. 1975. The growth patterns, productivity, and phytosociology of soaptree yucca. M.S. Thesis, New Mexico State Univ. 87 pp.

345 Smith, S.D. and J.A. Ludwig. 1976. Reproductive and vegetative growth patterns in Yucca elata Engelm. (Liliaceae). Southwest. Nat., 21:145-149.

346 Smith, S.D. and J.A. Ludwig. 1978. Further studies on growth pattern in Yucca elata. Southwest. Nat., 23:145-150.

347 Smith, W.E. 1977. Factors affecting the nesting success of the large carpenter bee Xylocopa californica arizonensis Cresson. M.S. Thesis, New Mexico State Univ. 25 pp.

348 Smith, W.E. and W.G. Whitford. 1976. Seasonal activity and water loss in four species of Eleodes (Coleoptera: Tenebrionidae). Southwest Entomol., 1:161-163.

349 Smith, W.E. and W.G. Whitford. 1978. Factors affecting the nesting success of the large Carpenter Bee, Xylocopa californica arizonensis. Environ. Entomol., 7:614-616.

350 Sosebee, R.E. 1966. The effects of soil temperature and moisture on seedling emergence and initial growth. M.S. Thesis, New Mexico State Univ. 61 pp.

351 Sosebee, R.E. and C.H. Herbel. 1969. Effects of high temperatures on emergence and initial growth of range plants. Agron. J., 61:621-624.

352 Staffeldt, E.E. and K. Besmond. 1974. Decomposition carbon and nitrogen changes. US/IBP Desert Biome Res. Mem. 74-38, Utah St. Univ. Logan.

353 Staffeldt, E.E. and K.B. Vogt. 1975. Mycorrhizae of desert plants. US/IBP Desert Biome Res. Memo. 75-37. Utah St. Univ., Logan.

354 Stein, R.A. 1977. Vegetation and soil patterns on a Chihuahuan desert bajada. M.S. Thesis, New Mexico State Univ. 67 pp.

355 Stein, R.A. and J.A. Ludwig. 1979. Vegetation and soil patterns on a Chihuahuan desert bajada. Amer. Midl. Nat., 101:28-37.

356 Steinberger, Y. and W.G. Whitford. 1983. The contribution of shrub pruning by jackrabbits to litter input in a Chihuahuan desert ecosystem. J. Arid. Environ., 6:183-187.

357 Steinberger, Y. and W.G. Whitford. 1983. The contribution of rodents to decomposition processes in a desert ecosystem. J. Arid Environ., 6:177-181.

358 Suleiman, H. 1976. Effects of grazing on herbage dynamics of vine mesquite (Panicum obtusum H.B.K.). M.S. Thesis, New Mexico State Univ.

359 Suliman, M.M. 1980. Population dynamics of grassforb complexes on a semidesert range and some demographic aspects of James rushpea (Hoffman-seggia jamesii Torr. and Gray). Ph.D. Dissertation, New Mexico State Univ. 58 pp.

360 Syvertsen, J.P. and G.L. Cunningham. 1977. Rate of leaf production and senescence and effect of leaf age on net gas exchange in creosotebush Photosynthetica, 11:161-166.

361 Syvertsen, J.P. and G.L. Cunningham. 1979. The effects of irradiating adaxial or abaxial leaf surface on the rate of net photosynthesis of Perezia nana and Helianthus annuus. Photosynthetica, 13:287-293.

362 Syvertsen, J.P., G.L. Cunningham and T.V. Feather. 1975. Anomalous diurnal patterns of stem xylem water potentials in Larrea tridentata. Ecology, 56:1423-1428.

363 Syvertsen, J.P., G.L. Nickell, R.W. Spellenberg and G.L. Cunningham. 1976. Carbon reduction pathways and standing crop in three Chihuahuan desert plant communities. Southwest. Nat., 21:311-321.

364 Tadingar, T. 1982. Utilization of standing crop by cattle under seasonal short duration grazing and seasonal continuous grazing on a semidesert tobosa rangeland. M.S. Thesis, New Mexico State Univ. 128 pp.

365 Torres-Hernandez, G. 1974. Some factors influencing fall weights of cows under southern New Mexico range conditions. M.S. Thesis, New Mexico State Univ. 42 pp.

366 Tromble, J.M. 1982. Water ponding for increasing soil water on arid rangelands. J. Range Manage., 35:601-603.

367 Trujillo, R.L. 1977. Nutritive evaluations of forage grazed from semidesert rangeland with assessment of seasonal trends and effects of dietary supplements. Ph.D. Dissertation, New Mexico State Univ. 62 pp.

368 Upson, A. and W.G. McGinnies. 1939. Range research contributes to progress in range management. Cattleman, 25(11):65, 67-69.

369 Urbaniak, S. and W.G. Whitford. 1983. Decomposition rates of various quantities of buried litter in a desert. Southwest. Nat., 28:111-112.

370 Valentine, K.A. 1946. Determining the grazing use of grasses by scaling. J. Forestry, 44:528-529. (N.M. Agr. Exp. Sta. Journ. Art. 39)

371 Valentine, K.A. 1947. Effect of water-retaining and water-spreading structures in revegetating semidesert rangeland. N.M. Agr. Exp. Sta. Bull. 341.

372 Valentine, K.A. 1947. Distance from water as a factor in grazing capacity of rangeland. J. Forestry, 45:749-754. (N.M. Agr. Exp. Sta. Journ. Art. 44)

373 Valentine, K.A. 1967. Seasonal suitability, a grazing system for ranges of diverse vegetation types and condition classes. J. Range Manage., 20:395-97. (N.M. Agr. Exp. Sta. Journ. Art. 275)

374 Valentine, K.A. 1970. Influence of grazing intensity on improvement of deteriorated black grama range. N.M. Agr. Exp. Sta. Bull. 553.

375 Valentine, K.A. 1970. Creosotebush control with phenoxy herbicides, picloram, and fuel oil in southern New Mexico. N.M. Agr. Exp. Sta. Bull. 554.

376 Valentine, K.A. and J.B. Gerard. 1968. Life-history characteristics of the creosotebush, Larrea tridentata. N.M. Agr. Exp. Sta. Bull. 526.

377 Valentine, K.A. and J.J. Norris. 1964. A comparative study of soils of selected creosotebush sites in southern New Mexico. J. Range Manage., 17:23-32. (N.M. Agr. Exp. Sta. Journ. Art. 204)

378 Vasquez-Aldapé, R. 1975. A comparison between photointerpretation and field vegetation mapping methods on the Jornada Experimental range. M.S. Thesis, New Mexico State Univ. 47 pp.

379 Wahl, C.R. 1979. Seasonal, interspecific, and intraspecific variation in the mobbing response of desert birds to different predator types. M.S. Thesis, New Mexico State Univ. 65 pp.

380 Walker, R.F. and W.G. Whitford. 1970. Soil water absorption capabilities in selected species of anurans. Herpetologica, 26:411-418.

381 Wallen, D.R. and J.A. Ludwig. 1978. Energy dynamics of vegetative and reproductive growth in Spanish bayonet (Yucca baccata Torr.). Southwest. Nat., 23:409-422.

382 Watkins, W.E. 1937. The calcium and phosphorus contents of important New Mexico range forages. N.M. Agr. Exp. Sta. Bull. 246.

383 Watkins, W.E. 1939. Monthly variation in carotene content of two important range grasses, Sporobolus flexuosus and Bouteloua eriopoda. J. Agr. Res., 58:695-99. (N.M. Agr. Exp. Sta. Journ. Art. 14)

384 Watkins, W.E. 1943. Composition of range grasses and browse at varying stages of maturity. N.M. Agr. Exp. Sta. Bull. 311.

385 Watkins, W.E. 1947. Nonprotein and carotene as an index of plant activity in range forage. J. Agr. Res., 75:63-69. (N.M Agr. Exp. Sta. Journ. Art. 45)

386 Watkins, W.E. and J.H. Knox. 1945. The monthly protein and phosphorus contents of two important range grasses of Southern New Mexico. J. Anim. Sci., 4:298-305. (N.M. Agr. Exp. Sta. Journ. Art. 34)

387 Watkins, W.E. and J.H. Knox. 1948. Inorganic blood phosphorus levels necessary for satisfactory production of range cattle in the Southwest. J. Anim. Sci., 3:263-272. (N.M. Agr. Exp. Sta. Journ. Art. 46)

388 Watkins, W.E. and J.H. Knox. 1950. The relation of the carotene content of range forage to the vitamin A requirement of breeding cows. J. Anim. Sci., 9:24-29. (N.M. Agr. Exp. Sta. Journ. Art. 55)

389 Watkins, W.E. and W.W. Repp. 1964. Influence of location and season on the composition of New Mexico range grasses. N.M. Agr. Exp. Sta. Bull. 486.

390 Watkins, W.E., J.H. Knox and J.W. Benner. 1950. Carotene and Vitamin A in the blood plasma of range cows. N.M. Agr. Exp. Sta. Bull. 355.

391 Watts, J.G. 1963. Insects associated with black grama grass. Ann. Entomol. Soc. Amer., 56:374-379. (N.M. Agr. Exp. Sta. Journ. Art. 174)

392 Watts, J.G. 1965. Chirothrips falsus on black grama grass. N.M. Agr. Exp. Sta. Bull. 499.

393 Watts, J.G. and A.C. Bellotti. 1967. Some new and little known insects of economic importance on range grasses. J. Econ. Entomol., 60: 961-63. (N.M. Agr. Exp. Sta. Journ. Art. 264)

394 Ward, C., G. Richardson and E.W. Huddleston. 1972. Survey of aquatic invertebrates at the Jornada site. US/IBP Grassland Biome. Res. Mem. 72-4, Colorado St. Univ., Ft. Collins.

395 Weir, W.W. 1937. Using salt to regulate grazing. Amer. Hereford, J., 28(8):30-31.

396 Welsh, R.G. 1972. Some ecological relationships between creosotebush and bush muhly. M.S. Thesis, New Mexico State Univ. 36 pp.

397 Welsh, R.G. and R.F. Beck. 1976. Some ecological relationships between creosotebush and bush muhly. J. Range Manage., 29:472-475. (N.M. Agr. Exp. Sta. Journ. Art. 574)

398 Weyer, J.K. 1978. An archaeological survey of nine seismographic test lines for Exxon company in Dona Ana and Luna counties, New Mexico. Cultural Resources Manage. Div. Rep. 227, New Mexico State Univ. 119 pp.

399 Whitford, W.B. and W.G. Whitford. 1973. Combat in the horned lizard, Phyrnosoma cornutum. Herpetologica, 29:191-192.

400 Whitford, W.G. 1971. Jornada Validation Site Report. US/IBP Desert Biome Res. Mem. 71-4. Utah State Univ., Logan.

401 Whitford, W.G. 1972. Jornada Validation Site Report. US/IBP Desert Biome Res. Mem. 72-4, Utah State Univ., Logan.

402 Whitford, W.G. 1972-73. Intensity of foraging activity as a function of temperature, humidity, light, food availability, and soil moisture in a desert ecosystem. US/IBP Desert Biome Res. Mem. 72-32, 73-29, and 73-32. Utah State Univ., Logan.

403 Whitford, W.G. 1973. Nearest neighbors in herbivorous ant colonies. US/IBP Desert Biome Res. Mem. 73-32. Utah State Univ., Logan.

404 Whitford, W.G. 1973. Foraging intensity of herbivorous ants in a desert ecosystem. US/IBP Desert Biome Res. Mem. 73-29. Utah State Univ., Logan.

405 Whitford, W.G. 1973. Annual and perennial grass and forb production in a desert ecosystem. US/IBP Desert Biome Res. Mem. 73-29. Utah State Univ., Logan.

406 Whitford, W.G. 1973. Food items foraged by herbivorous ants in a desert ecosystem. US/IBP Desert Biome Res. Mem. 73-29. Utah State Univ., Logan.

407 Whitford, W.G. 1973. Forager population estimates in a desert ecosystem. US/IBP Desert Biome Res. Mem. 73-29, Utah State Univ., Logan.

408 Whitford, W.G. 1973. Jornada Validation Site US/IBP Desert Biome Res. Mem. 73-4. Utah State Univ., Logan.

409 Whitford, W.G. 1974. Jornada Validation Site Report. US/IBP Desert Biome Res. Mem. 74-4. Utah State Univ., Logan.

410 Whitford, W.G. 1975. Jornada Validation Site Report. US/IBP Desert Biome Res. Mem. 75-4. Utah State Univ., Logan.

411 Whitford, W.G. 1975. The impact of consumers in a desert ecosystem. US/IBP Desert Biome Res. Mem. 75-22. Utah State Univ., Logan.

412 Whitford, W.G. 1976. Temporal fluctuations in density and diversity of desert rodent populations. J. Mammal., 57:351-369.

413 Whitford, W.G. 1976. Foraging behavior of Chihuahuan Desert harvester ants. Amer. Midl. Nat., 95:455-458.

414 Whitford, W.G. 1978. Structure and seasonal activity of Chihuahuan Desert ant communities. Ins. Soc., 25:79-87.

415 Whitford, W.G. 1978. Foraging in seed-harvester ants Pogonomyrmex spp.. Ecology, 59:185-189.

416 Whitford, W.G. 1978. Foraging by seed harvesting ants. pp.107-110 In Brian, M.V. (Ed.) Production Ecology of Ants and Termites. Cambridge Univ. Press, NY.

417 Whitford, W.G. and M. Bryant. 1979. Behavior of a predator and its prey: The horned lizard and harvester ant. Ecology, 60:686-694.

418 Whitford, W.G. and F.M. Creusere. 1977. Seasonal and yearly fluctuations in Chihuahuan Desert lizard communities. Herpetologica, 33:54-65.

419 Whitford, W.G. and G. Ettershank. 1972. Demography and role of herbivorous ants in a desert ecosystem as functions of vegetation, soil and climate variables. US/IBP Desert Biome Res. Mem. 72-32. Utah St. Univ., Logan.

420 Whitford, W.G. and G. Ettershank. 1975. Factors affecting foraging activity in Chihuahuan desert harvester ants. Environ. Entomol., 4: 689-696.

421 Whitford, W.G. and J. Ludwig. 1973. Air temperatures, air relative humidity, and solar radiation studies at the Jornada site. US/IB Desert Biome Res. Mem. 71-5, 72-4, 73-4, 74-4. Utah State Univ., Logan.

422 Whitford, W.G. and M. Massey. 1970. Responses of a population of Ambystoma tigrinum to thermal and oxygen gradients. Herpetologica, 26:372-376.

423 Whitford, W.G. and K.H. Meltzer. 1976. Changes in O2 consumption, body water and lipid in burrowed desert juvenile anurans. Herpetologica, 32:23-25.

424 Whitford, W.G. and P.F. Santos. 1980. Arthropods and detritus decomposition in desert ecosystems. pp. 770-778, In Dindal, D.L. (Ed.) Soil Biology as Related to Land Use Practices, EPA, Washington, D.C.

425 Whitford, W.G. and R.E. Sherman. 1968. Aerial and aquatic respiration in axolotl and transformed Ambystoma tigrinum. Herpetologica, 24:233-237.

426 Whitford, W.G., D.J. DePree and R.K. Johnson. 1978. The effects of twigs girdlers (Cerambycidae) and node borers (Bostrichidae) on primary production in mesquite (Prosopis glandulosa). J. Arid Environ., 1:345-350.

427 Whitford, W.G., E. Depree and P. Johnson. 1980. Foraging ecology of two Chihuahuan Desert ant species: Novomessor cockerelli and Novomessor albisetosus. Ins. Soc., 27:148-156.

428 Whitford, W.G., P. Johnson and J. Ramirez. 1975. Comparative ecology of the harvester ants Pogonomyrmex barbatus (F. Smith) and Pogonomyrmex rugosus (Emery). US/IBP Desert Biome Res. Mem. 75-28. Utah State Univ., Logan.

429 Whitford, W.G., P. Johnson and J. Ramirez. 1976. Comparative ecology of the harvester ants Pogonomyrmex barbatus (F. Smith) and Pogonomyrmex rugosus (Emery). Ins. Soc., 23:117-132.

430 Whitford, W.G., R.K. Johnson and D.J. DePree. 1975. Studies on wood borers, girdlers and seed predators of mesquite. US/IBP Desert Biome Res. Mem. 75-26. Utah State Univ., Logan.

431 Whitford, W.G., C.A. Kay and A.M. Schumacher. 1975. Water loss in Chihuahuan desert ants. US/IBP Desert Biome Res. Memo. 75-77. Utah State Univ., Logan.

432 Whitford, W.G., C.A. Kay and A.M. Schumacher. 1976. Water loss in Chihuahuan Desert ants. Physiol. Zool., 48:390-397.

433 Whitford, W.G., J. Ludwig and T. O'Laughlin. 1973. Soil temperatures at 10 and 50 cm for the Jornada site. US/IBP Desert Biome Res. Mem. 73-4, Utah State Univ., Logan.

434 Whitford, W.G., Y. Steinberger and G. Ettershank. 1982. Contributions of subterranean termites to the "economy" of Chihuahuan Desert Ecosystems. Oecologia, 55:298-302.

435 Whitford, W.G., D.J. Depree, P. Hamilton and G. Ettershank. 1981. Foraging ecology of seed-harvesting ants, Pheidole spp. in a Chihuahuan Desert ecosystem. Amer. Midl. Nat., 105:159-167.

436 Whitford, W.G., S. Dick-Peddie, D. Walters and J.A. Ludwig. 1978. Effects of shrub defoliation on grass cover and rodent species in a Chihuahuan desert ecosystem. J. Arid Environ., 1:237-242.

437 Whitford, W.G., R. Repass, L.W. Parker and N.Z. Elkins. 1982. Effects of initial litter accumulation and climate on litter disappearance in a desert ecosystem. Amer. Midland Nat., 108(1):105-110.

438 Whitford, W.G., M. Bryant, G. Ettershank, J. Ettershank and P.F. Santos. 1980. Surface litter breakdown in a Chihuahuan Desert ecosystem. Pedobiologia, 4:243-245.

439 Whitford, W.G., D.W. Freckman, N.Z. Elkins, L.W. Parker, R. Parmalee, J. Phillips and S. Tucker. 1981. Diurnal migration and responses to simulated rainfall in desert soil microarthropods and nematodes. Soil Biol. Biochem., 13: 417-425.

440 Whitford, W.G., V. Meentemeyer, T.R. Seastedt, K. Cromack, D.A. Crossley, P. Santos, R.L. Todd and J.B. Waide. 1981. Exceptions to the AET model: deserts and clear-out forest. Ecology, 62:275-277.

441 Whitson, P.D. 1975. Factors contributing to production and distribution of Chihuahuan desert annuals. US/IBP Desert Biome Res. Memo. 75-11. Utah State Univ., Logan.

442 Wiens, J.A. 1971. Avian ecology and distribution in the Comprehensive Network, 1970. US/IBP Grassland Biome Tech. Rep. No. 77. Colorado State Univ., Ft. Collins.

443 Wiens, J.A. 1973. Pattern and process in grassland bird communities. Ecol. Monogr., 43:237-270.

444 Willemsma, H.A. 1980. Postweaning growth and reproductive performance of brangus and crossbred heifers. M.S. Thesis, New Mexico State Univ. 47 pp.

445 Williams, J.F. and B.J. Rankin. 1981. Postweaning growth and carcass characteristics of crossbred steers. Proc. West. Sec., Amer. Soc. Anim. Sci., 32:303-306.

446 Wilson, E.W. 1922. Calf crop increase on the Jornada. Farm, 3(3):1-2, 21.

447 Wilson, E.W. 1934. The influence of precipitation and grazing on black grama range. U.S. Dep. Agr. Tech. Bull. 409.

448 Winder, J.A. 1979. Postweaning growth and reproductive performance of Hereford, Brangus and reciprocal crossbred heifers. M.S. Thesis, New Mexico State Univ. 63 pp.

449 Winder, J.A. and B.J. Rankin. 1979. Postweaning growth and reproductive performance of Hereford, Brangus and reciprocal crossbred heifers. Proc. West. Sec., Amer. Soc. Anim. Sci., 30:28-33. (N.M. Agr. Exp. Sta. Res. Paper 130)

450 Wisdom, W.A. 1980. Diversity and density of ants on herbicide treated rangelands. M.S. Thesis, New Mexico State Univ. 55 pp.

451 Wisdom, W.A. 1981. Effects of vegetation change on ant communities of arid rangelands. Environ. Entomol., 10:893-897.

452 Wood, J.E. 1965. Response of rodent populations to controls. J. Wildl. Manage., 29:425-437. (N.M. Agr. Exp. Sta. Journ. Art. 217)

453 Wood, J.E. 1969. Rodent populations and their impact on desert rangelands. N.M. Agr. Exp. Sta. Bull. 555.

454 Woods, D.E. 1970. Nitrogen transformation in a desert grassland soil. M.S. Thesis, New Mexico State Univ. 50 pp.

455 Wooten, E.O. 1911. Cacti in New Mexico. N.M. Agr. Exp. Sta. Bull. 78.

456 Wooten, E.O. 1913. Trees and shrubs of New Mexico. N.M. Agr. Exp. Sta. Bull. 87.

457 Wooten, E.O. 1915. Factors affecting range management in New Mexico. U.S. Dep. Agr. Bull. 211.

458 Wooten, E.O. 1918. Certain desert plants as emergency stock feed. U.S. Dep. Agr. Bull. 728.

459 Wooten, E.O. and P.C. Standley. 1911. The grasses and grass-like plants of New Mexico. N.M. Agr. Exp. Sta. Bull. 81.

460 Wooten, E.O. and P.C. Standley. 1916. Flora of New Mexico. U.S. Dept. Agr. Vol. 19.

461 Wooten, R.C. 1973. Physiology of the desert millipede Orthoporus ornatus. M.S. Thesis, Univ. New Mexico, Albuquerque.

462 Wright, M.E. 1965. Habitat analysis of the genus Neotoma in southern Rio Grande Valley, New Mexico. M.S. Thesis, New Mexico State Univ. 31 pp.

463 Wright, M.E. 1973. Analysis of habitats of two woodrats in southern New Mexico. J. Mammal., 54:529-535.

464 Wright, R.A. 1960. Increase of mesquite on a southern New Mexico desert grassland range. M.S. Thesis, New Mexico State Univ. 55 pp.

465 Wright, R.A. 1982. Aspects of desertification in Prosopis dunelands of southern New Mexico, U.S.A. J. Arid Environ., 5:277-284.

466 Wright, R.G. 1972. Computer processing of chart quadrat maps and their use in plant demographic studies. J. Range Manage., 25:476-478.

467 Wright, R.G. 1972. A demographic study of a semidesert grassland. Ph.D. Dissertation, Colorado State Univ. 221 pp.

468 Wright, R.G. and G.M. Van Dyne. 1976. Environmental factors influencing semidesert grassland perennial grass demography. Southwest. Nat., 21:259-274.

469 Wright, R.G. and G.M. Van Dyne. 1981. Population age structure and its relationship to the maintenance of a semidesert grassland undergoing invasion by mesquite. Southwest. Nat., 26:13-22.

470 Young, S.A. 1980. Phenological development and impact of season and intensity of defoliation on Sporobolus flexuosus and Bouteloua eriopoda. M.S. Thesis, New Mexico State Univ. 110 pp.