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Contributions to the Gramineae of Bernalillo County, New Mexico

James McDonald Rominger

GRAMINEAE OF BERNALILLO COUNTY — ROMINGER

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CONTRIBUTIONS TO THE GRAMINEAE OF BERNALILLO COUNTY, NEW MEXICO

By

James McDonald Rominger

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Submitted in Partial Fulfillment of the
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INTRODUCTION

An attempt has been made to collect, identify, and classify all the grasses of the four tribes Agrostideae, Andropogoneae, Aveneae, and Chlorideae within the confines of Bernalillo County, New Mexico. Specimens have been examined from the herbarium of the University of New Mexico, the regional Forest Service herbarium, and the regional Soil Conservation Service herbarium, all located in Albuquerque. Species reported from Bernalillo County in these herbaria and unobserved by the author have been included in this thesis.

In an effort to minimize confusion concerning nomenclature, I have included a list of synonyms which have appeared most frequently in the literature of the past century. Hitchcock's Manual of the Grasses of the United States (1950) has been consulted as the final authority on the validity of scientific names.

An outline map of Bernalillo County accompanies each species collected in an attempt to show the general distribution and relative abundance of each. The distribution as shown on these maps is primarily a result of direct observation by the author, but also includes data from the available herbaria in the county and from

previous literature. The green markers do not always indicate that an individual specimen has been collected from a particular locale, but they do indicate that the species in question has been observed in that locale.

It has not been possible to explore exhaustively the flora of a given area. The author recognizes the fact that certain species of grasses not reported from Bernalillo County may be present. A chapter discussing these notable absentees has been included.

ECONOMIC IMPORTANCE OF GRASSES IN BERNALILLO COUNTY

Economically, the most important single family of plants is the Gramineae. To this family belong such giants of agriculture as the cereals, sugar cane, sorghum, and bamboo. The most important food plants are the cereals, which include wheat, corn, barley, rice, oats, rye, millet, and many sorghums. Not only do grasses yield food for man directly but they also furnish food for livestock, which in turn produce meat for humans. The principal hay producing grasses are timothy (Phleum pratense), redtop (Agrostis alba) and Johnson grass (Sorghum halepense). These three species are widespread hay producers although a few western areas have their own indigenous species used for this purpose. Among these are Stipa comata, which grows in abundance on the northern Great Plains and Andropogon saccharoides, which is widespread through areas of Texas. Indian grass (Sorghastrum nutans) was an important wild hay crop on the Great Plains prior to cultivation of much of that area, but is now found principally along roadsides, ditches, and waste places.

Buchloe dactyloides is a well-known sod-forming grass of the Great Plains. This species is economically one of the most important "short grasses" that once

covered the area from the Texas Panhandle to South Dakota. In New Mexico and Arizona the dominant grasses are grama (Bouteloua spp.) and needlegrasses (Aristida spp.), which are bunch grasses, not sod-formers. Blue grama (Bouteloua gracilis) and black grama (Bouteloua eriopoda) are the most valuable forage grasses of this group. The needlegrasses, although widespread throughout the Southwest, are of lesser forage value. In New Mexico blue grama is most abundant in the northern part of the state. As a result of overgrazing and unsuccessful cultivation of native blue grama grasslands, less desirable plants have moved in to reclaim the wind-eroded areas. Black grama is a very drought resistant species found abundantly throughout southern New Mexico. In Bernalillo County blue grama is usually found at slightly higher elevations than black grama. Another grama of some importance is Bouteloua curtipendula, commonly referred to as sideoats grama. This is the tallest species of grama. It has a sporadic distribution, and seldom forms pure stands.

In some years, during the spring season, the mesas of the southwestern deserts appear green following the first rainfall as a result of the rapid growth and maturation of a few annual species of grasses. These constitute an important part of the forage during the

spring and early summer months. This group is called collectively the six-weeks grasses and is represented by two species in Bernalillo County. They are Bouteloua barbata and Aristida adscensionis, and are both widely scattered over the sandy mesas. Other species of grasses common to the Southwest, which are of value as forage plants include Texas timothy (Lycurus phleoides), spike redtop (Agrostis exarata), alkali sacaton (Sporobolus airoides), sand dropseed (Sporobolus cryptandrus), and bush muhly (Muhlenbergia Porteri). Lycurus phleoides is found on the dry, rocky hillsides often in association with blue grama (Bouteloua gracilis). This species is commonly termed Texas timothy due to a superficial resemblance of the spike to that of true timothy (Phleum pratense). Agrostis exarata is indigenous of moist meadows at high altitudes. This species is an excellent forage grass but cannot survive on the dry mesas of lower altitudes. Sporobolus airoides is extremely tolerant of alkaline soils such as are found bordering the Rio Grande. This species constitutes a major part of wild hay cut in the valley areas. Sporobolus cryptandrus is much more drought resistant than Sporobolus airoides, but is more widely scattered, seldom forming stands worthy of cutting for hay. Sporobolus cryptandrus is

palatable to livestock and grows in many waste places such as vacant lots and roadside ditches. Probably the most promising single species for use in reseeding denuded areas is Muhlenbergia Porteri. This species has many common names including bush muhly, mesquite grass, and hoe grass. It is called bush muhly because of its rounded, bushlike appearance. The term mesquite grass is applied because this species often grows in close association with mesquite, intertwining its wiry culms among the mesquite branches for support. If protected from grazing, mesquite grass will eventually eliminate the less desirable mesquite, a feat quite remarkable in the arid mesas (Goodding, 1938, p. 26). The name hoe grass was given to this species by the cavalrymen of the United States Army who used hoes to collect tons of hay from this species to feed their horses. The hay was collected and stored in the forts. This species played an important role in supporting the blue-shirted Indian fighter of about a century ago. And now this same hardy perennial gives the most promise as an erosion control grass to reclaim dry areas lost to non-palatable, weedy plants.

Without exception, all grasses have one inherent virtue, and this is holding the soil against wind and

water erosion. This soil binding virtue is of great concern to all farmers and livestock men everywhere and is of especial interest to the livestock men of the Southwest. A few species of grasses which are common on the mesas but have little value as forage grasses, although good soil binders, are Aristida Fendleriana, Aristida longiseta, Muhlenbergia arenicola, Muhlenbergia Emersleyi, and Muhlenbergia Torreyi. The presence of Aristida Fendleriana is indicative of an overgrazed condition (Goodding, 1938, p. 10). Aristida longiseta is palatable when young but its awns become stiff and sharp at maturity. Muhlenbergia Emersleyi is palatable to horses particularly, and has a diffuse root system which makes it a good erosion control grass. Low seed productivity of this species limits its use in erosion control projects (Goodding, 1938, p. 25).

In the four tribes of grasses studied in Bernalillo County there are two species used commonly as lawn grasses. These two are Bermuda grass (Cynodon dactylon) and redtop (Agrostis alba). Bermuda grass is not an ideal lawn grass for two primary reasons. As a result of physiological processes controlled by its genetic composition, Bermuda grass tends to lose its chlorophyll early in the autumn and remains brown throughout the entire winter.

Secondly, Bermuda grass sends out an abundance of stolons or runners, which get into adjacent vegetable and flower gardens, requiring continuous weeding. Redtop is used as a supplementary grass in lawn mixtures because of its rapid growth, but often does not survive continued close cutting (Dittmer, 1950).

Two species of grasses collected in Bernalillo County are of especial interest because of their importance as primitive foodstuff for the native American Indian and for the early explorers of the Southwest. These two species are Sporobolus giganteus and Oryzopsis hymenoides. Oryzopsis hymenoides, commonly called Indian ricegrass, is a valuable forage grass. Both the culm and grain are highly palatable. Indians of the Southwest ground these plump grains into flour for their bread (Gould, 1951, p. 256). Sporobolus giganteus, called giant dropseed, was a source of food for the Indians and early Spanish explorers. The grains were mixed with crude sugar, carried in a pouch, and used as a concentrated food. The term "pinole" was applied to this form of nourishment (Goodding, 1938, p. 39).

Only one species of grass in this collection can truly be classed as toxic to livestock, although certain species can be harmful to grazing animals by mechanical

means. Stipa comata has an awn which becomes indurate at maturity and can puncture the skin of browsing animals. The awns of most species of Aristida become sharp at maturity and can cause injury to grazing livestock. However, the only species that contains toxic juices is Johnson grass (Sorghum halepense). This grass has previously been mentioned as of considerable import as a hay producer. This is true because the dried hay is free of toxic juice and is good food for animals. About 1900, the United States Department of Agriculture received reports from California of the rapid and violent death of several cattle following rather large consumption of green Johnson grass (Crawford, 1906). This report, followed by other scattered reports of similar incidents, prompted study of the chemistry of young Johnson grass plants. Chemical analysis of fresh, green Johnson grass culms revealed the presence of hydrocyanic acid, formed by enzymatic action on more complex compounds (Crawford, 1906). Chemical analysis of related species in the genus Sorghum produced similar evidence. Johnson grass is still grown for hay in some areas but eradication programs are underway to eliminate it as a roadside weed and pest.

ECOLOGY OF GRASSES IN BERNALILLO COUNTY

The area within the boundaries of Bernalillo County, New Mexico, exhibits a wide diversity of plant associations. This diversity shows the effect of the widely varying climatic conditions brought about by the marked differences in elevation throughout the county. The elevation ranges from just below 5,000 feet at the Rio Grande to just above 10,500 feet at the crest of the Sandia Mountains. As one progresses from the Rio Grande to the peak of the Sandia Mountains, he passes through a series of plant associations. The state of New Mexico includes six such associations as described by Weaver and Clements (1938). These six are the (1) desert plains grassland, (2) mixed grassland, (3) pinon-juniper, (4) yellow pine, (5) spruce-fir, and (6) alpine tundra. The purpose of the following discussion is to enumerate the conspicuous grasses that occur in each.

The desert plains grassland and alpine tundra are not truly represented in Bernalillo County. Alpine tundra occurs on scattered mountain peaks in the northern part of the state, usually at elevations above 12,000 feet. The desert plains grassland is represented widely throughout the southern part of the state and its northern limit

approaches and possibly enters Bernalillo County. Bouteloua eriopoda and Hilaria mutica, dominant grasses of the desert plains grassland, are present in Bernalillo County, indicating the probable existence of an ecotone or transition zone between the desert plains grassland and the mixed grassland associations.

The mixed grassland association characterizes most of the county below the elevation of 6,500 feet. Grasses are of greatest abundance and widest variety in this association, and become gradually less numerous as the elevation increases. The dominant grasses are mostly short bunch grasses, but a few mid grasses are of importance. The mid grasses that Weaver and Clements (1938, p. 523) describe as being mixed grassland dominants are Stipa comata, Sporobolus cryptandrus, Agropyron Smithii, and Koeleria cristata. Of these, only Sporobolus cryptandrus occupies its designated position in Bernalillo County. The other three mid grasses, being more mesic, are found at higher elevations. Another mid grass present in the mixed grassland association of Bernalillo County is Muhlenbergia Porteri, which Weaver and Clements (1938, p. 525) describe as a dominant of the desert plains grassland association. It is usually found among xeric shrubs, where it is protected from grazing animals. Some of the short grasses

in the mixed grassland are not dominant species, but have become the prevalent vegetation as a result of the overgrazing of the area. These short grasses comprise a disclimax which to the casual observer appears to be a true desert plains grassland (Weaver and Clements, 1938, p. 525). The mixed grassland association in this county is dominated by four genera, Bouteloua, Aristida, Sporobolus, and Hilaria. Hilaria, although not among the tribes included in this study, is an important genus from an ecological viewpoint. Tobosa grass (Hilaria mutica) is a characteristic species of the desert plains grassland, commonly found in association with black grama (Bouteloua eriopoda). Galleta (Hilaria Jamesii) is a characteristic grass of the mixed grassland and is usually in close association with blue grama (Bouteloua gracilis). Sporobolus cryptandrus and two closely related species, Sporobolus contractus and Sporobolus giganteus, are dominant species usually found below elevations of 5,500 feet. The more predominant species of the intermontane basin below 6,500 feet are Bouteloua gracilis, Bouteloua eriopoda, Bouteloua hirsuta, Aristida divaricata, Aristida Wrightii, Aristida longiseta, and Aristida longiseta var. robusta. Two very common species that are found in association with species of Aristida are

Muhlenbergia arenicola and Muhlenbergia Torreyi. Lycurus phleoides is found in association with species of Bouteloua. During the spring and early summer two annual species, Aristida adscensionis and Bouteloua barbata, become widespread throughout the mixed grassland association. Three species of mid grasses that extend along arroyos and moist ditches from the pinon-juniper forest into the mixed grassland are Bouteloua curtipendula, Leptochloa dubia, and Andropogon barbinodis. Of these, Bouteloua curtipendula is most widespread.

Certain species of grasses in this county are restricted to the moist soil bordering the Rio Grande and the adjacent irrigation canals. Most prevalent of these grasses are Polypogon monspeliensis, Agrostis semiverticillata, Muhlenbergia asperifolia, and Sphenopholis obtusata. Sporobolus airoides thrives on the moist alkaline soil common to the river valley. The common species that inhabit the moist ditches in the river valley are Sorghastrum nutans, Sorghum halepense, and Andropogon saccharoides. Of these three, only Andropogon saccharoides is indigenous to this county.

The second association represented in Bernalillo County is the pinon-juniper association, an open forest of short, well-spaced trees that rarely exceed a height

of thirty feet. From personal observation the dominant species of this association appear to be Pinus edulis, Juniperus monosperma, and in some locales Juniperus scopulorum. Emory's oak (Quercus Emoryi), also called bellota, is sometimes an important subdominant species. The pinon-juniper association is bordered by the mixed grassland association below and the yellow pine association above, and covers an approximate elevation range of 6,000 to 8,000 feet. A wide assortment of grasses grow on the forest floor between the well-spaced trees. These include Bouteloua gracilis, Bouteloua curtipendula, Bouteloua hirsuta, Stipa comata, Lycurus phleoides, Muhlenbergia Emersleyi, Aristida Fendleriana, and Oryzopsis Bloomeri. Roadside ditches in this association are inhabited by Leptochloa dubia and Andropogon barbinodis. The most conspicuous and characteristic grasses are Bouteloua gracilis, Bouteloua curtipendula, Lycurus phleoides, and Stipa comata.

The third association is the yellow pine association, an altitudinal band of 7,000 to 9,000 feet. Pinus ponderosa is the dominant plant, and is often found in association with Douglas fir (Pseudotsuga taxifolia). Gambel's oak (Quercus Gambelii) and aspen (Populus tremuloides) constitute a subclimax stage that flourishes

in burned-over areas. The forest floor of the yellow pine association supports a few scattered perennial grasses including Blepharoneuron tricholepis, Koeleria cristata, Oryzopsis micrantha, Muhlenbergia Richardsonis, Muhlenbergia Wrightii, and Muhlenbergia pauciflora.

The spruce-fir association is represented in the Sandia and Manzano Mountains in Bernalillo County at elevations above 9,000 feet, the dominant species being Picea Englemanni and Abies lasiocarpa. In this association grasses play a rather unimportant role, although a few open boulder fields near the crest of the Sandia Mountains are inhabited by Trisetum spicatum, Koeleria cristata, and Stipa columbiana. Other grasses growing on the open forest floor are Agrostis exarata, Agrostis scabra, and Blepharoneuron tricholepis. Trisetum spicatum and Stipa columbiana are the most conspicuous grasses of this association.

KEYS TO TRIBES, GENERA AND SPECIES; GENERIC DESCRIPTIONS AND DISTRIBUTION OF EACH SPECIES

Key to tribes of Gramineae

Point of disarticulation below the glumes; spikelets with only one perfect floret; reduced florets always below the perfect one

Spikelets mostly in pairs, one sessile and perfect, the other pedicellate and sterile, or staminate, or reduced to only a pedicel----------Andropogoneae

Point of disarticulation usually above the glumes; spikelets with 1 to many perfect florets; reduced florets above the perfect ones

Spikelets 1-flowered; spikelets arranged in panicles Agrostideae

Spikelets 1 to many flowered; if 1-flowered then in true spikes or spikelike racemes

Inflorescences in 1-sided spikes or spikelike racemes Chlorideae

Inflorescences are panicles or racemes, but may be spikelike in appearance; spikelets 2 to many flowered----------Aveneae

Key to the genera of the Agrostideae

Point of disarticulation below the glumes, glumes falling with floret as a unit; panicle spikelike, not open

Spikelets falling in pairs; first glume with two awns ---------- Lycurus

Spikelets falling singly; first glume with one awn ---------- Polypogon

Point of disarticulation above the glumes, glumes persistent, floret falling singly; panicle open or spikelike

Glumes and lemmas awnless

Glumes longer than lemma ---------- Agrostis

Glumes shorter than lemma

Nerves of lemma villous ---------- Blepharoneuron

Nerves of lemma not villous

Lemma 1-nerved; caryopsis falling from floret at maturity ---------- Sporobolus

Lemma 3-nerved; caryopsis enclosed in floret at maturity ---------- Muhlenbergia

Glumes or lemmas awned

Lemma awnless; panicle spikelike ---------- Phleum

Lemma awned; panicle open or spikelike

Awn of lemma three-branched ---------- Aristida

Awn simple

Lemma awned from below tip ---------- Agrostis

Lemma awned from tip

Fruit thin; callus not well developed
Muhlenbergia
Fruit terete; callus well developed
Awn strongly twisted below, persistent
Stipa
Awn straight or loosely twisted, deciduous
Oryzopsis

Agrostis L. BENTGRASS.

Spikelets 1-flowered, disarticulating above the glumes; glumes usually equal, awnless, acute to acuminate, slightly longer than the floret; lemma awnless or occasionally dorsally awned; palea shorter than the lemma, often nerveless, reduced, or entirely absent; inflorescence an open, contracted, or spikelike panicle; annuals or perennials often bearing stolons or rhizomes. The generic name comes from Greek *agrostis* meaning a type of grass. All of the species collected in Bernalillo County are perennials with flat leaf blades.

Key to species of *Agrostis*

Panicle open at maturity
Palea evident, at least 1 mm. long; rhizomes present
A. alba
Palea minute or absent, less than 1 mm. long; rhizomes absent----------*A. scabra*
Panicle contracted at maturity

Palea minute or absent, less than 1 mm. long; dorsal midnerve extended from above the middle of the lemma as a slender bristle; stolons absent-----A. exarata

Palea evident, at least 1 mm. long; no bristle arising from dorsal side of the lemma; stolons present

Glumes scabrous on entire dorsal surface; panicle compact; spikelets small, 1.5 to 2 mm. long A. semiverticillata

Glumes scabrous only on dorsal midnerve, dorsal surface glabrous; panicle loosely contracted; spikelets larger, 2 to 2.5 mm. long---A. palustris

Agrostis alba L. Sp. Pl. 63. 1753; ed. 2. 1:93. 1762.

REDTOP.

A. alba is not native, but has escaped from cultivation and is now found along moist ditches and watered fields. In cooler areas it is cultivated extensively as a pasture and hay crop and is used in lawns and sports turf. A. alba has been collected from the University of New Mexico golf course and from residential lawns in Albuquerque. It is commonly found along the edges of streams and irrigation canals, in meadows, lawns, and on moist ground.

Selected synonyms: Agrostis stolonifera var. major Farwell, Mich. Acad. Sci. Rpt. 21:351. 1920.

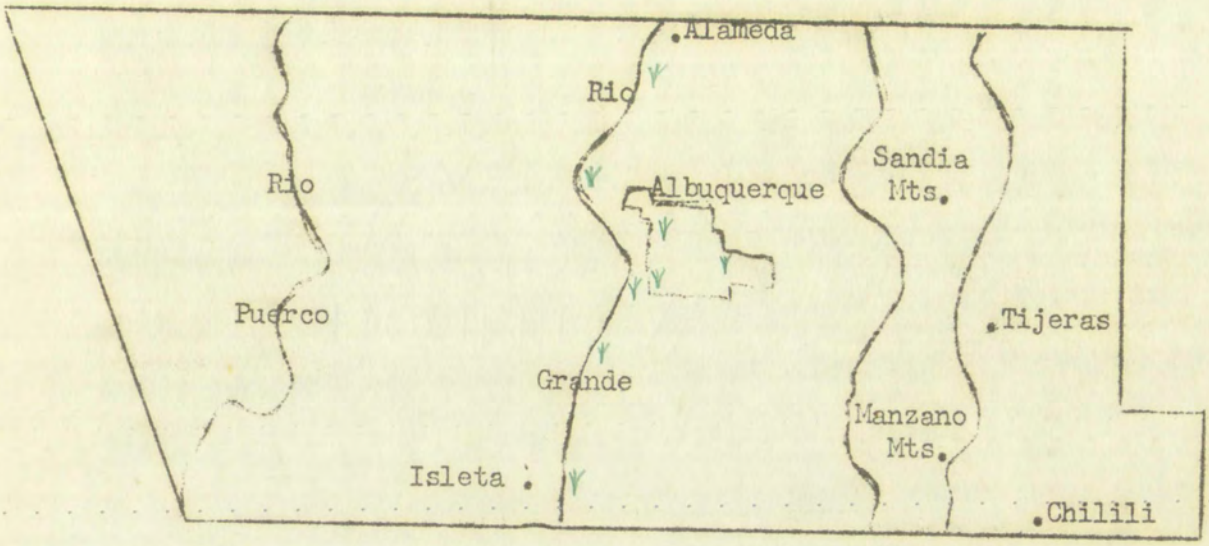

Fig. 1 Distribution of Agrostis alba

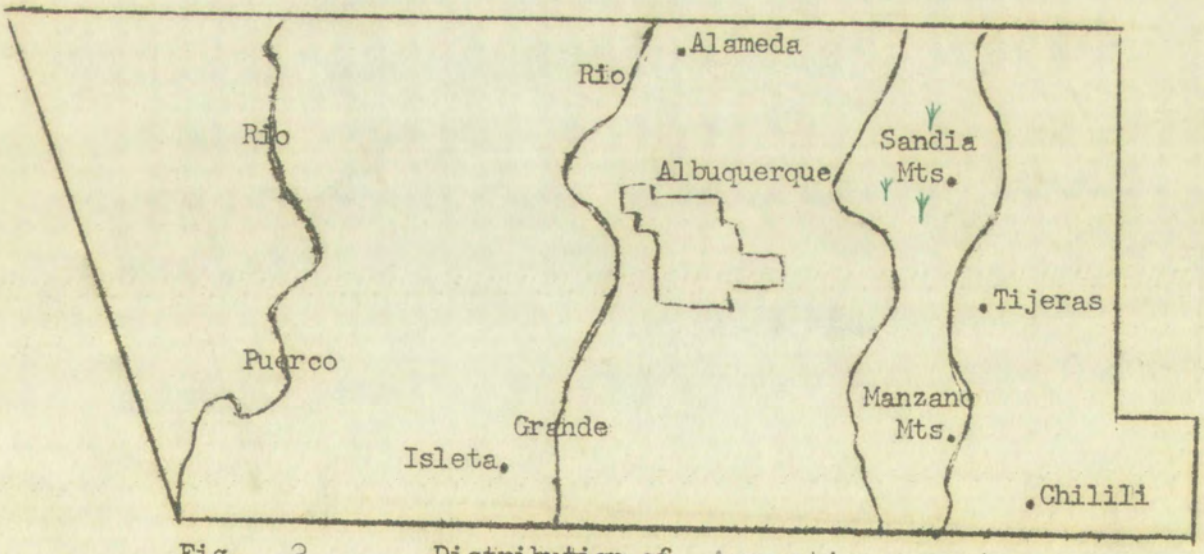

Fig. 2 Distribution of Agrostis exarata

Agrostis exarata Trin., Gram. Unifl. 207. 1824. SPIKE BENT, SPIKE REDTOP.

A. exarata was collected in a roadside ditch of the Sandia Loop Drive at an approximate elevation of 8,500 feet. This is a highly valuable forage grass commonly found in moist meadows and open woodlands at elevations above 6,000 feet.

Selected synonyms: Agrostis ampla forma monolepis Beetle, Torrey Bot. Club Bul. 72:544. 1945.

Agrostis palustris Huds., Fl. Angl. 27. 1762. CREEPING BENTGRASS.

A. palustris has been introduced into this country and is found in moist ditches, fields, and lawns. It has been collected from the University of New Mexico golf course and from a moist roadside ditch two miles south of Isleta Pueblo on U. S. Highway 85.

Selected synonyms: Agrostis alba var. palustris Pers., Syn. Pl. 1:76. 1805.

Agrostis stolonifera var. palustris Farwell, Mich. Acad. Sci. Rpt. 21:351. 1920.

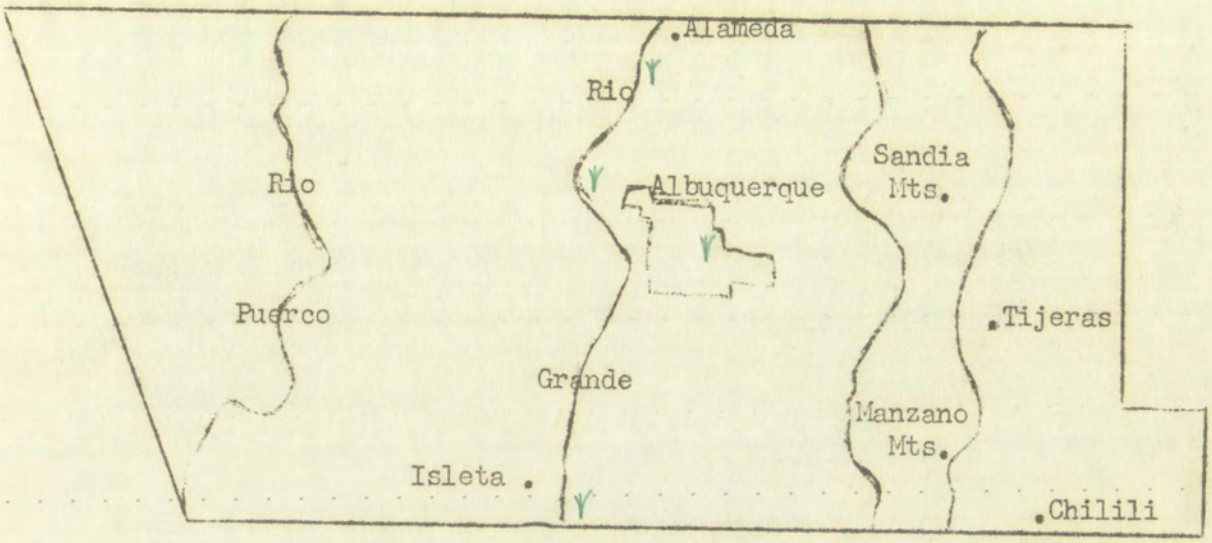

Fig. 3 Distribution of *Agrostis palustris*

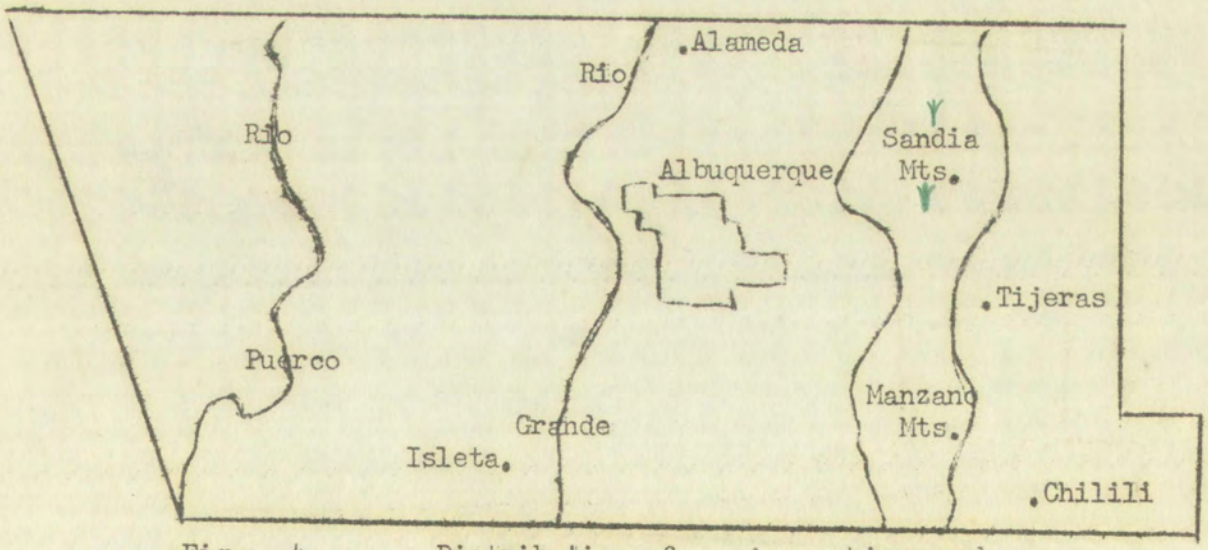

Fig. 4 Distribution of *Agrostis scabra*

Agrostis scabra Willd., Sp. Pl. 1:370. 1797.

A. scabra was collected near Sandia Crest in an open meadow at approximately 10,000 feet. It is commonly found in mountain meadows and open woodlands at high elevations in association with Koeleria cristata and Trisetum spicatum.

Selected synonyms: Agrostis laxiflora Richards, Bot. App. Franklin Jour. 731. 1823.

Agrostis geminata Trin., Gram. Unifl. 207. 1824.

Agrostis hiemalis var. geminata Hitchc., U. S. Dept. Agr., Bur. Plant Indus. Bul. 68:44. 1905.

Agrostis semiverticillata (Forsk.) C. Christ, Dansk Bot. Arkiv 4:12. 1922. WATER BENT.

A. semiverticillata is very common in Bernalillo County along the banks of irrigation canals where it is found growing in association with Polypogon monspeliensis and Hordeum jubatum. A. semiverticillata was collected from the edge of the Riverside Drain northwest of the intersection of State Highway 47 and U. S. Highway 85 north of Alameda.

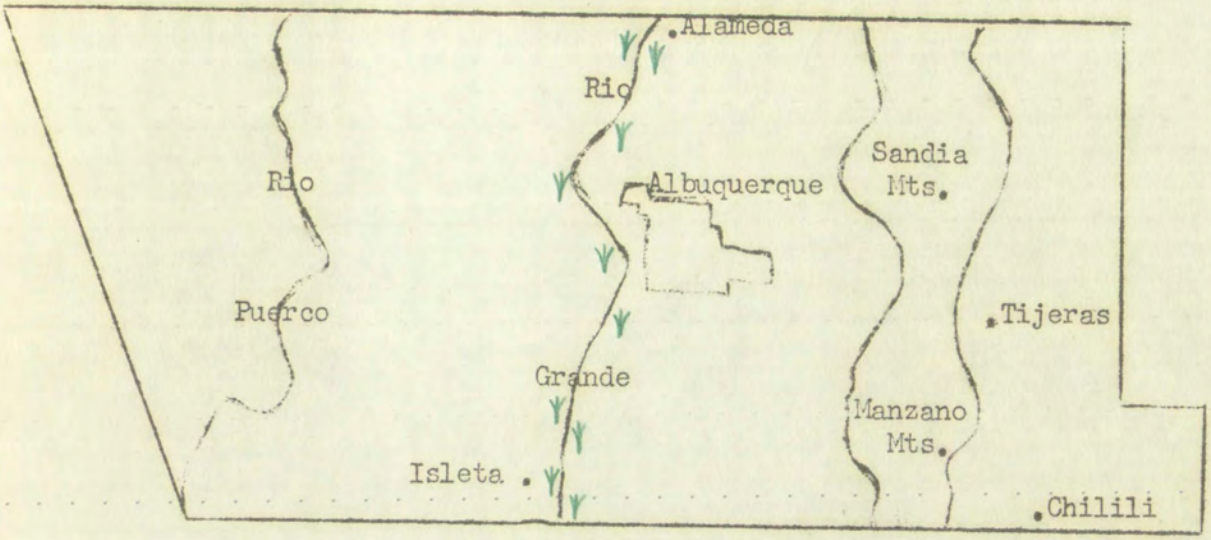

Fig. 5 Distribution of Agrostis semiverticillata

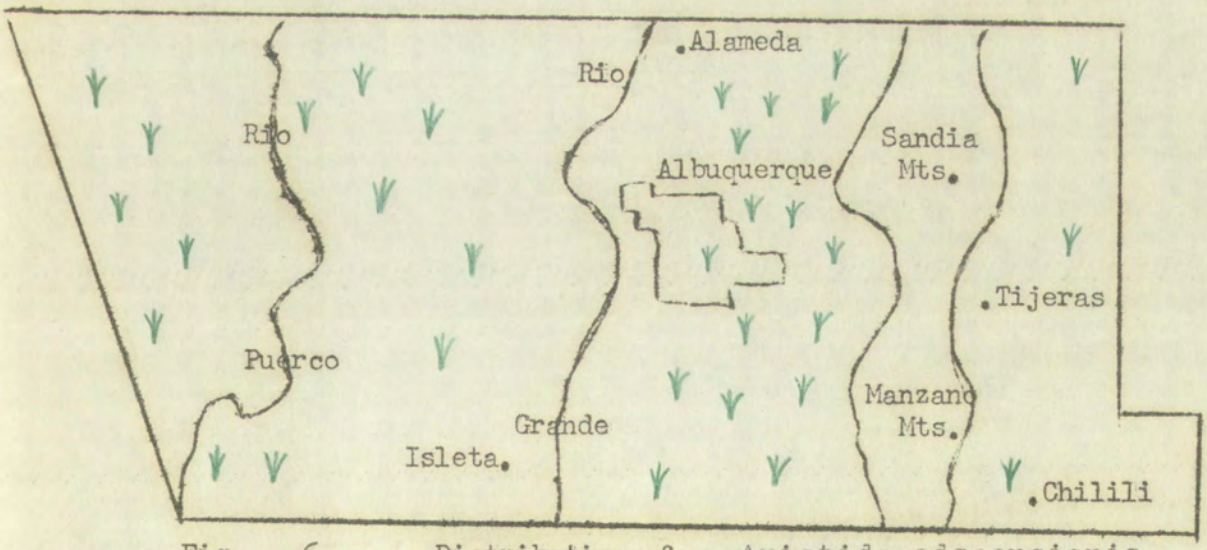

Fig. 6 Distribution of Aristida adscensionis

Selected synonyms: Phalaris semiverticillata Forsk., Fl. Aegypt. Arab. 17. 1775.

Agrostis verticillata Vill., Prosp. Pl. Dauph. 16. 1779.

Polypogon semiverticillatus Hoover, West. Bot. Leaflets 5:38. 1948.

Aristida L., THREE-AWN, TRIPLE-AWN GRASS.

Spikelets 1-flowered, disarticulating above the glumes, glumes narrow acute to awn-tipped; lemma indurate, with sharp-pointed, pubescent callus at base; lemma bearing three awns which are often united at base to form an awn column; panicle narrow to open; annuals or tufted perennials; blades usually involute.

The generic name is derived from the Latin arista meaning awn. Most species of Aristida on the Southwest plains are palatable to livestock only when the plants are young. Some species of Aristida are considered weeds on the southwestern mesas and their presence indicates an overgrazed condition.

Selaginella synonyma: Selaginella semivertillata

Torrey., Pl. Lapt. Arch. 17. 1775.

Lycopodium vertillata L.,

Prodr. Pl. Gun. 16. 1779.

Polypodium semivertillata

Hoover, Veat 9t. Leaflets 5:38. 1942-43.

Aristida L., THREE-AWN, TRIPLE-AWN GRASS.

Spikes 1-flowered, disarticulating above the glumes, glumes narrow acute to awn-tipped; lemma narrate, with sharp-pilled, puberulent callusses at base; lemma bearing three awns wits are often united at base to form a awn column; paleal narrow to open; anthoecia or bulbo-vem-niale; plants usually involute.

The generic name is derived from the Latin Aristata meaning awn. Det species of Aristatida on the coastal plains are palatable to livestock during when the plants are young. Ice species of Aristatidae are considered weds on the southeastern areas and their presence indicate an overgraze condition.

Key to species of Aristatida

Plants annual----------A. ascensionis

Plants perenni

Awns mostly more than 6 cm. long;; second glume more than 2 cm. long----------A. longseta

Awns mostly less than 6 cm. long;; second glume less than 2 cm. long

Panicle widely spreading, diffuse--------A. divaricata

Panicle narrow, contracted

Culms mostly less than 30 cm. tall; blades short, curly and clustered at base----------A. Fedeliana

Culms mostly more than 30 cm. tall; blades neither short, curly, nor clustered at base

Awns mostly less than 3 cm. long; first glume 6 to 8 mm. long----------A. Wrightii

Awns mostly more than 3 cm. long; first glume 9 to 12 mm. long----------A. longiseta var. robusta

Aristida ascensionis L., Sp. Pl. 822. 1753. SIX-WEEK THREEAW.

A. ascensionis is one of three six-week annuals that causes the desert mesas to appear green when the summer rains come. It is found among Aristatida longiseta and

Bouteloua barbata. It was collected five miles east of Albuquerque and one mile north of Embudo Arroyo. It commonly inhabits dry, open ground, sandy slopes, and arroyos.

Selected synonyms: Aristida bromoides H. B. K., Nov. Gen. et Sp. 1:122. 1815.

Aristida fasciculata Torr., Ann. Lyc. N. Y. 1:154. 1824.

Aristida divaricata Humb. and Bonpl. ex Willd., Enum. Pl. 1:99. 1809. POVERTY THREE-AWN.

A. divaricata was collected on the East Mesa six miles east of U. S. Highway 85 and three miles north of Bear Canyon Arroyo. It is found in association with Aristida longiseta and Bouteloua eriopoda. The panicle may become brittle and break off to form a tumbleweed. This grass is found on dry, open plains and sandy, rocky slopes.

Selected synonyms: Chaetaria divaricata Beauv., Ess. Agrost. 30, 158. 1812.

Aristida Palmeri Vasey, Torrey Bot. Club Bul. 10:42. 1883.

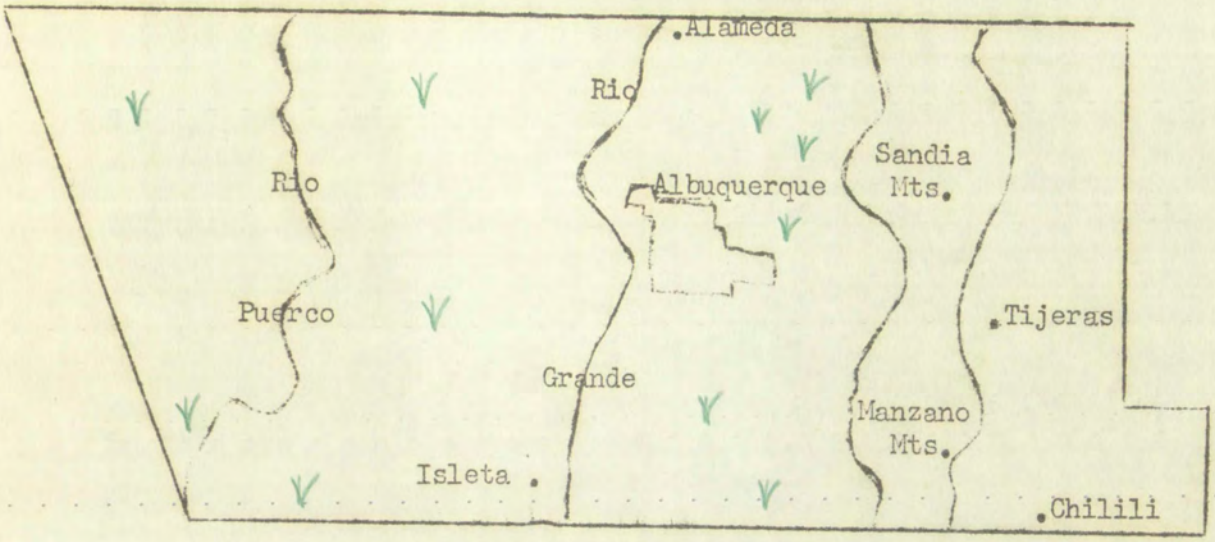

Fig. 7 Distribution of Aristida divaricata

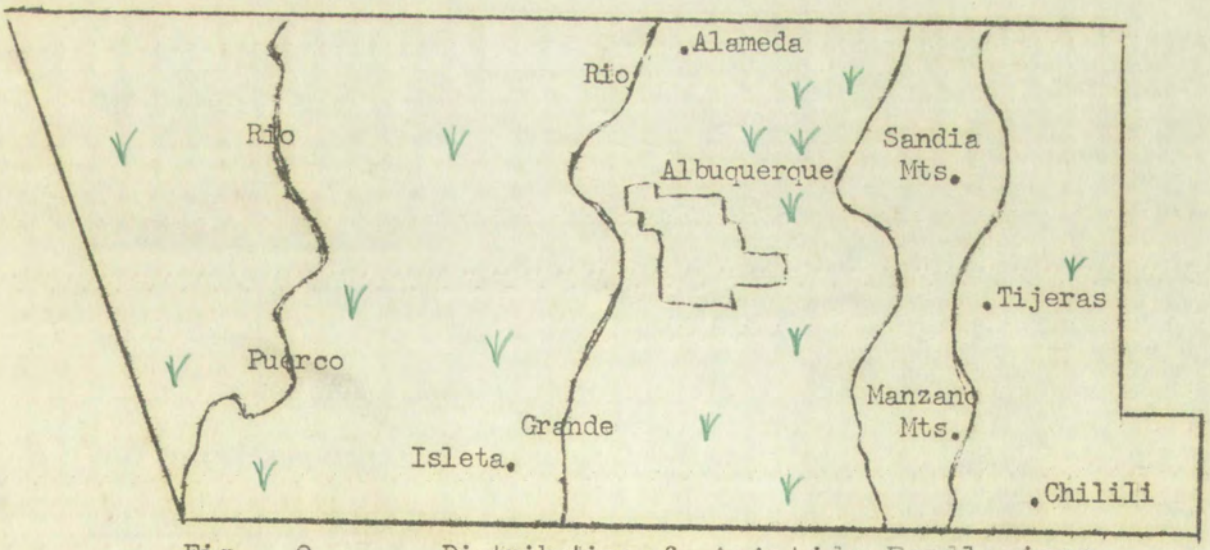

Fig. 8 Distribution of Aristida Fendleriana

Aristida Lemmoni Scribn., N. Y. Acad. Sci. Trans. 14:23. 1894.

Aristida Fendleriana Steud., Syn. Pl. Glum. 1:420. 1855.

FENDLER-THREE AWN.

A. Fendleriana was collected along Embudo Arroyo in the dry, sandy hills between the Sandia Mountains and the East Mesa, three miles northeast of Albuquerque city limits. A cluster of short, basal leaves distinguishes this species from other related species. It is a good soil binder, but its presence usually indicates overgrazed conditions (Goodding, 1938, p. 10). It is found on dry plains and sandy or rocky hills.

Selected synonyms: Aristida longiseta Fendleriana Merr., U. S. Dept. Agr., Div. Agrost. Cir. 34:5. 1901.

Aristida subuniflora Nash in Small, Fl. Southeast U. S. 116. 1903.

Aristida longiseta Steud., Syn. Pl. Glum. 1:420. 1855.

RED THREE-AWN.

A. longiseta is very common on the dry, sandy mesas surrounding Albuquerque. It grows in association with Scleropogon brevifolius, Bouteloua eriopoda and other

Aristida longiseta section.

N. Y. Acad. Sci. Trans. 14:25. 1894.

Aristida longiseta Steud., Syn. Pl. Glum. 1:320. 1855.

FENDLER-TURNER 4WW.

A. longiseta was collected along Monte Airpo in the dry, sandy hills between the Sandia Mountains and the East Mesa, three miles northeast of Albuquerque city limits. A cluster of about, dead leaves distinguishes this species from other related species. It is a good soil binder, but its presence usually indicates overgrazed conditions (Goodding, 1938, p. 10). It is found on dry plains and sandy or rocky hills.

Selected synonyms: *Aristida longiseta fendleriana* Merr., U. S. Dept. Agr., Div. Agrost. Bul. 24:9. 1901.

Aristida sumulifera Swan in Small, Fl. Southeast U. S. 116. 1903.

Aristida longiseta Steud., Syn. Pl. Glum. 1:320. 1855.

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A. longiseta is very common on the dry, sandy mesa surrounding Albuquerque. It grows in association with *Selerpogon brevifolius*, *Bouteloua eriopoda* and other

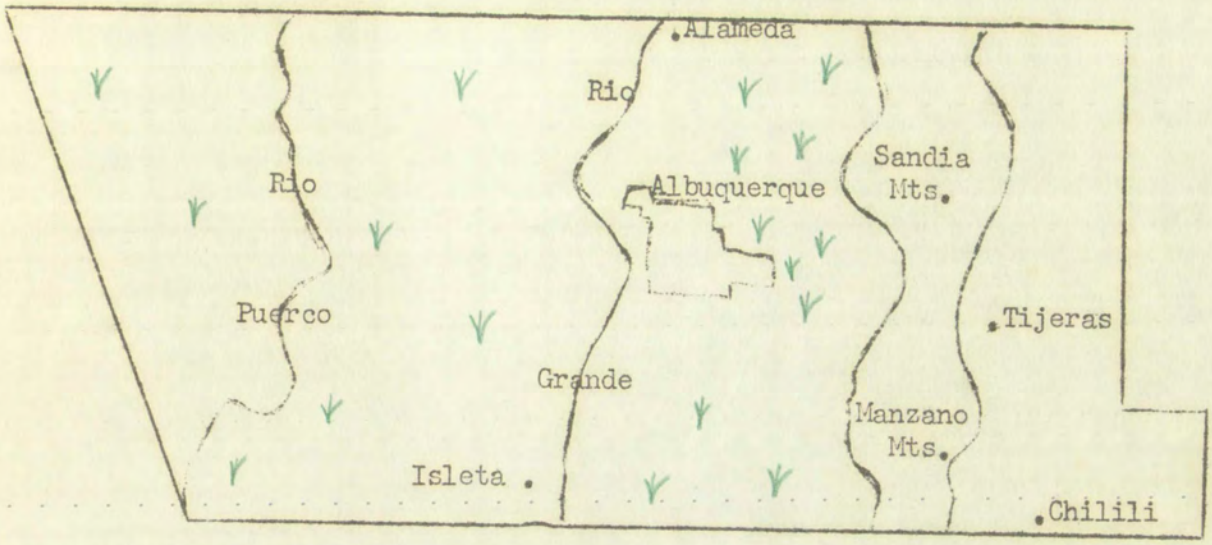

Fig. 9 Distribution of Aristida longiseta

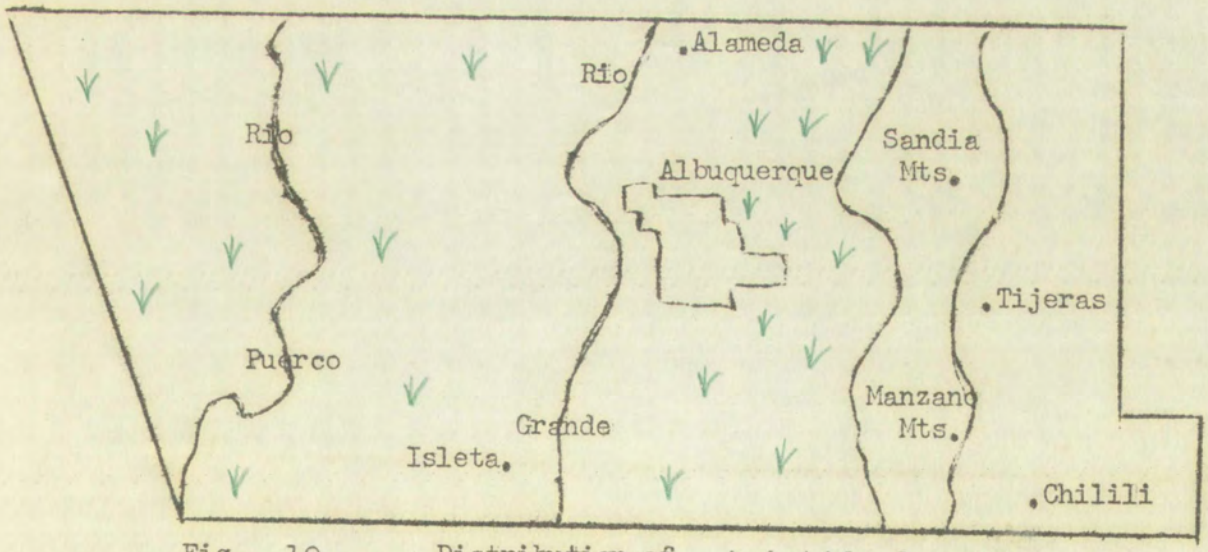

Fig. 10 Distribution of Aristida longiseta var. robusta

species of Aristida. When young, it is palatable to livestock. Collections of this species have been made six miles east of U. S. Highway 85 and two miles north of U. S. Highway 66. It is common on dry, sandy plains and mesas.

Selected synonyms: Aristida curtiseta Buckl., Acad. Nat. Sci. Phila. Proc. 1862:92. 1862.

Aristida longiseta var. robusta Merr., U. S. Dept. Agr., Div. Agrost. Cir. 34:5. 1901.

A. longiseta var. robusta differs from A. longiseta by having shorter awns, a stiffer, narrower panicle, and taller culms on the average. In this county this variety grows in dry, sandy soil in the same areas as A. longiseta, but it is more abundant further north in the state. A. longiseta var. robusta has been collected six miles east of U. S. Highway 85 and two miles north of U. S. Highway 66.

Selected synonyms: Aristida purpurea robusta Piper, U. S. Natl. Herb. Contrib. 11:107. 1906.

Aristida Wrightii Nash in Small, Fl. Southeast. U. S. 116. 1903.

A. Wrightii grows in dry, sandy soil. A specimen

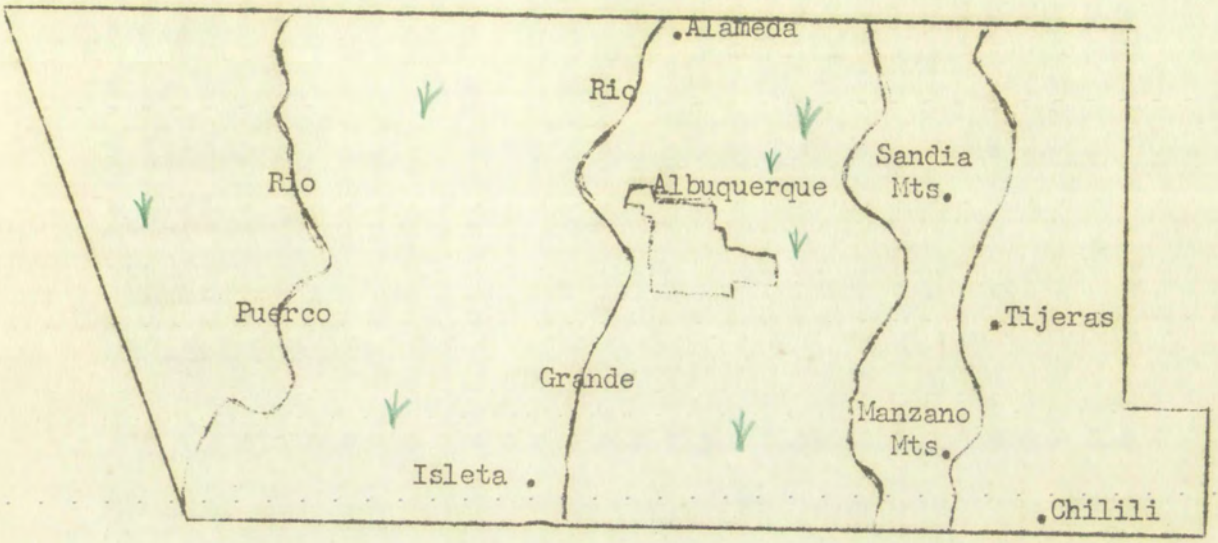

Fig. 11 Distribution of Aristida Wrightii

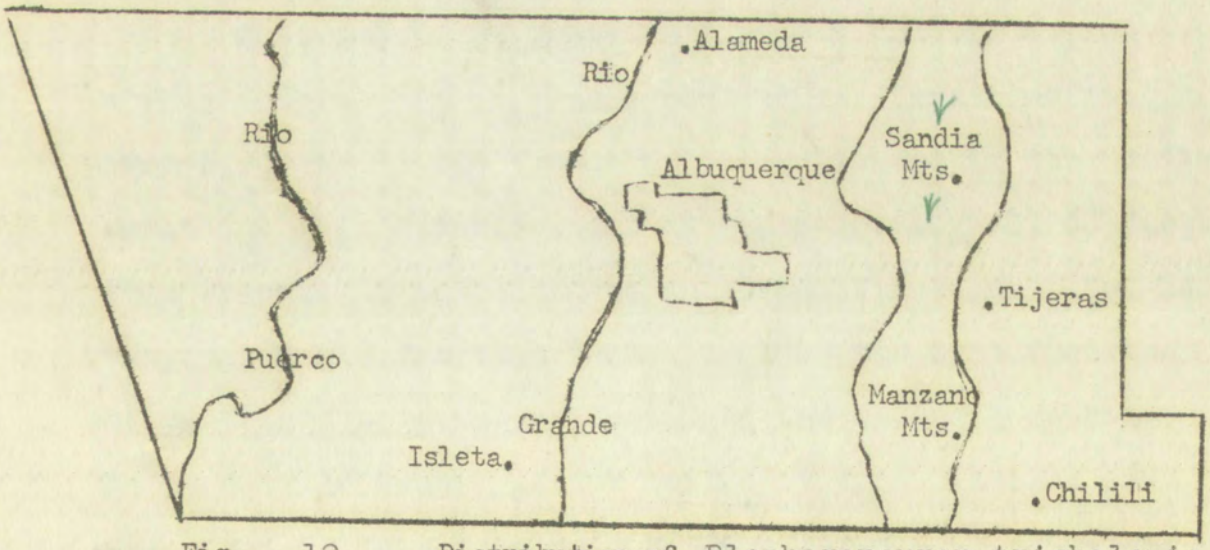

Fig. 12 Distribution of Blepharoneuron tricholepis

was collected eight miles east of U. S. Highway 85 and four miles north of U. S. Highway 66 in association with Scleropogon brevifolius, Bouteloua barbata, and Aristida longiseta.

Blepharoneuron Nash.

Spikelets 1-flowered, disarticulating above the glumes; glumes broad, awnless, first shorter than second; lemma 3-nerved, awnless, villous on the nerves; palea 2-nerved, villous between the nerves. The name comes from Greek blepharis meaning eyelash, and neuron, meaning nerve, in reference to the villous nerves of the lemma.

Blepharoneuron tricholepis (Torr.) Nash, Torrey Bot. Club Bul. 25:88. 1898. HAIRY DROPSEED, PINE DROPSEED.

This beautiful grass is found in ponderosa pine-spruce forests and in grassy meadows at elevations ranging from 6,000 to 11,000 feet. It was collected in the Sandia Mountains near Kiwanis Point at approximately 10,500 feet. This species is not abundant in Bernalillo County, but is very palatable for livestock. In 1857 the type specimen of B. tricholepis was collected in the Sandia Mountains in Bernalillo County of New Mexico by J. M. Bigelow and was named Vilfa tricholepis by John Torrey. Bigelow was

was collected eight miles east of Mt. Tilden, 65 and four miles north of U. S. Highway 66 in association with Solenogyne brevifolius, Antennaria parvifolia, and Matelea longiflora.

Blepharoneuron Nash.

Spikelets 1-flowered, disarticulating above the glumes; glumes broad, awnless, first shorter than second; lemma 3-nerved, awnless, villous on the nerves; palea 2-nerved, villous between the nerves. The genus comes from Greek blepharis meaning eyelash, and neuron, meaning nerve, in reference to the villous nerves of the lemma.

Blepharoneuron tricholepis (Torr.) Nash, Torrey Bot. Club Bul. 25:58. 1898. Muhly of Mexico, Tex. to Ariz.

This beautiful grass is found in ponderosa pine-spruce forests and in grassy meadows at elevations ranging from 8,000 to 11,000 feet. It was collected in the Sandia Mountains near Tijeras Point at approximately 10,500 feet. This species is not abundant in Bernalillo County, but is very palatable for livestock. In 1897, the type specimen of B. tricholepis was collected in the Sandia Mountains in Bernalillo County of New Mexico by C. V. Bigelow and was named Vilfa tricholepis by John Torrey. Bigelow was

a surgeon-botanist with the Mexican Boundary Survey and also with Lt. Whipple's Railroad Survey, and did extensive collecting in the Southwest (Bigelow, 1856).

Selected synonyms: Vilfa tricholepis Torr., U. S. Expl. Miss. Pacif. Rpt. 4:155. 1857.

Sporobolus tricholepis Coulter, Mon. Rocky Mount. 411. 1885.

Lycurus H. B. K.

Spikelets 1-flowered; spikelets disarticulating below the glumes and falling in pairs with the rachillas attached; spikelets laterally compressed; first glume usually 2-awned, second glume 1-awned; lemma longer than glumes, awned; palea almost equal to lemma, awnless; perennial with grayish, spikelike panicle.

Lycurus phleoides H. B. K., Nov. Gen. et Sp. 1:142. pl. 45. 1815. WOLFTAIL, TEXAS TIMOTHY.

L. phleoides is a gray, spikelike grass common on rocky hills and mesas. In the county it is found both on the East and West Mesas and is most common in Tijeras Canyon and on the western foothills of the Sandia Mountains. This species is an important forage grass, supplementing blue grama (Bouteloua gracilis)

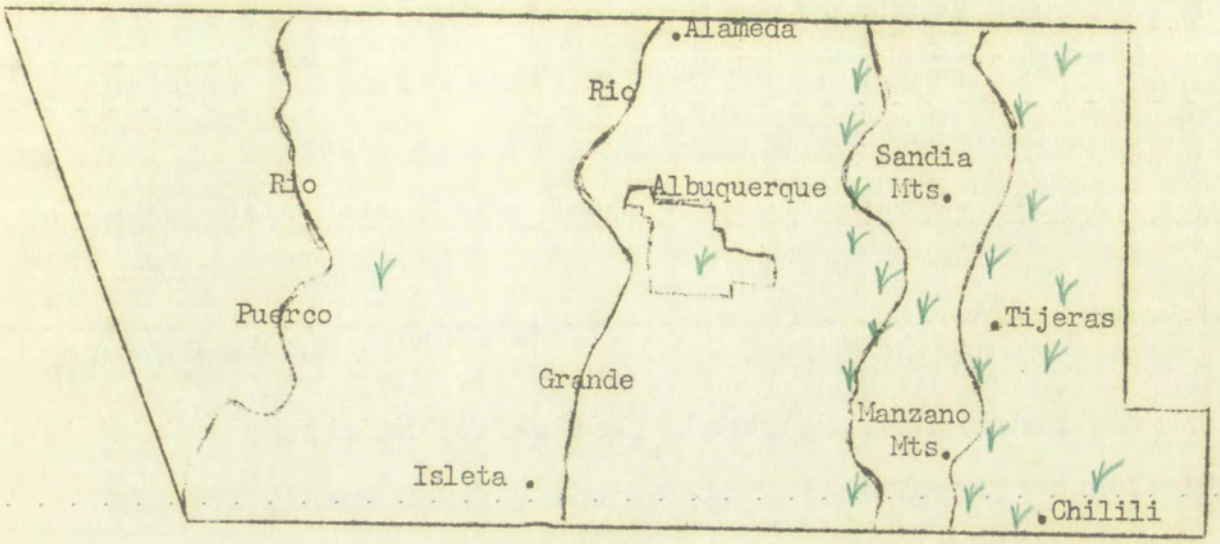

Fig. 13 Distribution of Lycurus phleoides

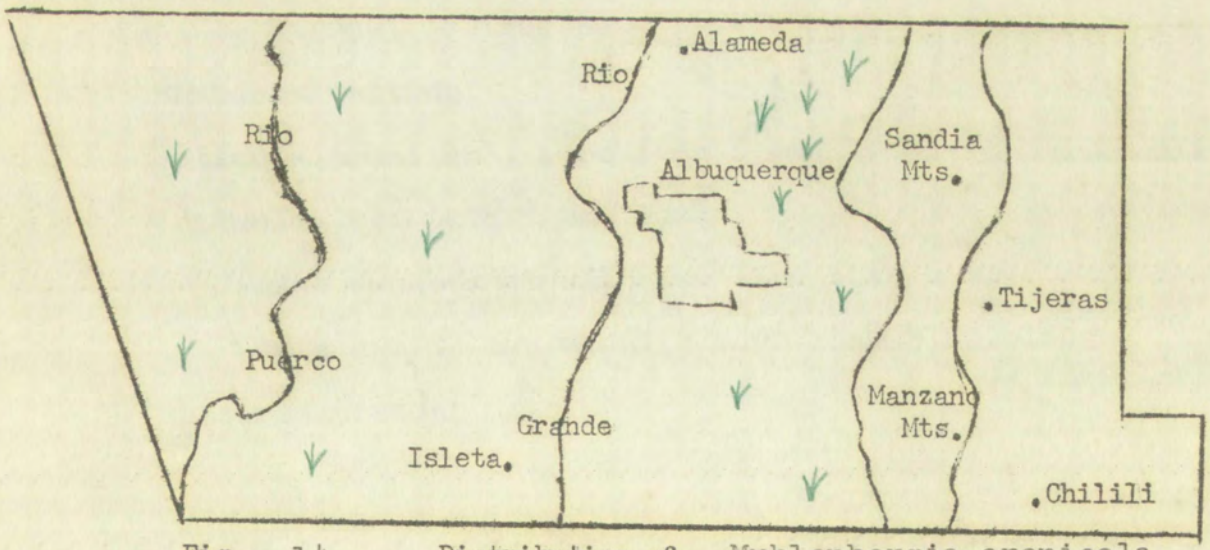

Fig. 14 Distribution of Muhlenbergia arenicola

on the southwestern ranges. Collections have been made in Tijeras Canyon ten miles east of U. S. Highway 85.

Selected synonyms: Pleopogon setosum Nutt., Acad. Nat. Sci. Phila. Jour. II. 1:189. 1848.

Muhlenbergia Schreb. MUHLY.

Spikelets 1-flowered, disarticulating above the glumes; glumes usually shorter than the floret, occasionally equal, usually awnless; lemma 3-nerved, usually with flexuous awn, or often acuminate or awnless; inflorescence varies from an open to spikelike panicle; usually perennial.

This genus is named in honor of G. H. E. Muhlenberg, famous agrostologist.

Key to species of Muhlenbergia

Panicle narrow, contracted
  Rhizomes wanting
    Ligule prominent, more than 8 mm. long---M. Emersleyi
    Ligule less than 5 mm. long
      Lemma awnless or with awn less than 2 mm. long
        M. Wrightii
      Lemma awned, awn usually more than 5 mm. long
        M. pauciflora
  Rhizomes present

Panicle dense, spikelike; rhizomes short, scaly;

culms usually over 40 cm. tall--------M. racemosa

Panicle few-flowered, not spikelike; rhizomes slender,

creeping; culms usually less than 40 cm. tall
M. Richardsonis

Panicle open

Rhizomes present----------M. asperifolia

Rhizomes absent

Culms usually less than 30 cm. tall------M. Torreyi

Culms mostly more than 30 cm. tall

Blades involute, clustered at base; awn of lemma

usually less than 3 mm. long--------M. arenicola

Blades flat, not clustered at base; awn of lemma

usually more than 5 mm. long--------M. Porteri

Muhlenbergia arenicola Buckl., Acad. Nat. Sci. Phila.

Proc. 1862:91. 1862. SAND MUHLY, TALL RINGGRASS.

M. arenicola thrives in sandy soil and was collected seven miles east of U. S. Highway 85 and four and one-half miles south of the Sandoval-Bernalillo County Line. It is similar to M. Torreyi but is consistently taller. It is often found in association with Bouteloua eriopoda, Bouteloua barbata, Muhlenbergia Torreyi, and Salsola pestifer. M. arenicola is not highly palatable but is desirable for binding the soil.

Selected synonyms: Podosaemum arenicola Bush., Amer. Midl. Nat. 7:40. 1921.

Muhlenbergia asperifolia (Nees and Mey.) Parodi, Univ. Nac. Buenos Aires Rev. Agron. 6:117. f. 1. 1928. ALKALI MUHLY.

M. asperifolia has a very diffuse and usually purple inflorescence. It is found in damp, saline soil in association with Distichlis stricta, desert saltgrass. It was collected two miles south of Isleta Pueblo at the edge of U. S. Highway 85. This grass has great possibilities as an erosion control grass as it has extensive rhizomes and forms a dense sod. It flourishes in highly saline soil but is limited to fairly moist ground.

Selected synonyms: Vilfa asperifolia Nees and Mey., Acad. St. Petersb. Mem. VI. Sci. Nat. 4:95. 1840.

Sporobolus asperifolius Nees, Nov. Act. Acad. Caes. Leop. Carol. 19:Sup. 1:9. 1841; 141. 1843.

Muhlenbergia Emersleyi Vasey, U. S. Natl. Herb. Contrib. 3:66. 1892. BULLGRASS.

This species apparently has many variations. The

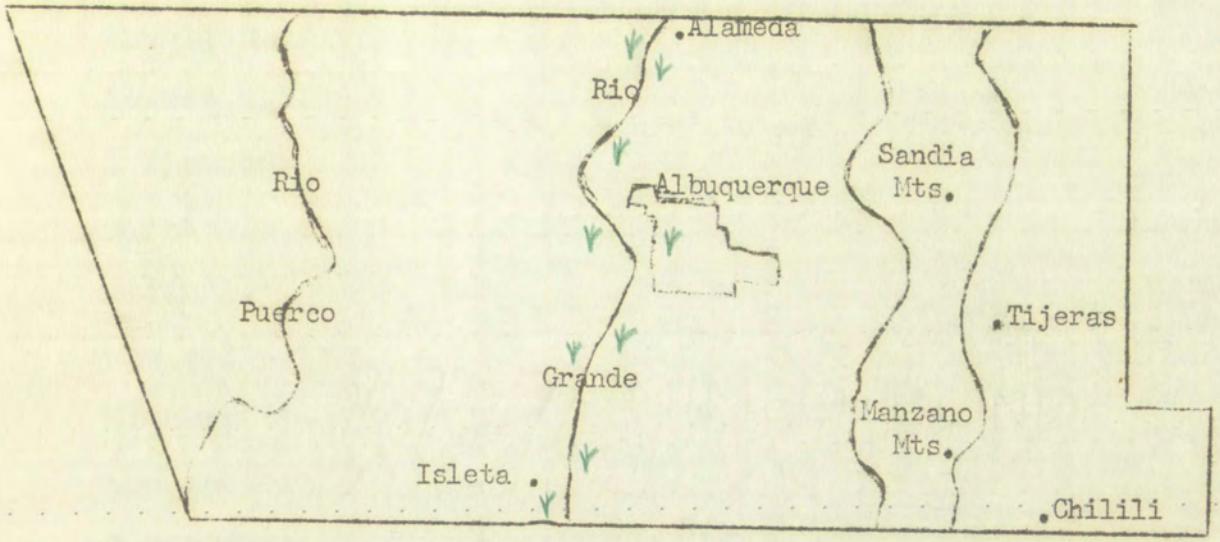

Fig. 15 Distribution of Muhlenbergia asperifolia

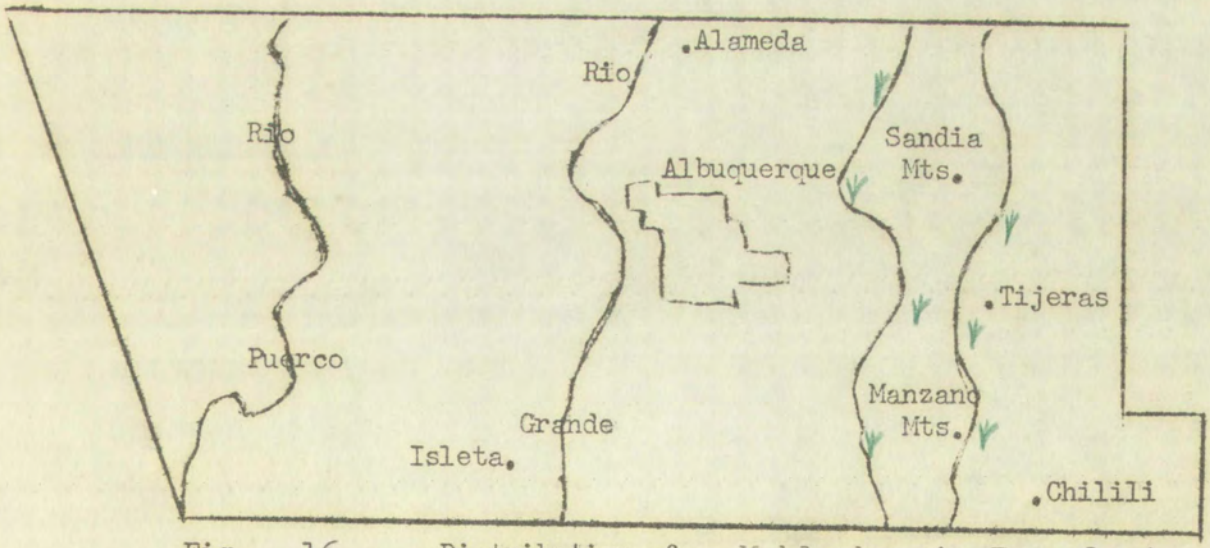

Fig. 16 Distribution of Muhlenbergia Emersleyi

specimen collected in Bernalillo County has awnless lemmas while M. Emersleyi is usually described as having a flexuous awn 1 to 2 cm. long. Bullgrass is highly palatable for horses. It has a dense mass of roots, making it a good erosion control grass. M. Emersleyi was collected on rocky slopes ten miles east of U. S. Highway 85 and four miles north of U. S. Highway 66 at the western edge of the Sandia Mountains at approximately 7,000 feet. It usually inhabits the dry soil of rocky slopes and forest openings.

Selected synonyms: Muhlenbergia Vaseyana Scribn., Mo. Bot. Gard. Rpt. 10:52. 1899.

Epicampes Emersleyi Hitchc., U. S. Dept. Agr. Bul. 772:144. 1920.

Epicampes subpatens Hitchc., U. S. Dept. Agr. Bul. 772:144. 1920.

Muhlenbergia pauciflora Buckl., Acad. Nat. Sci. Phila. Proc. 1862:91. 1862. NEW MEXICAN MUHLY.

M. pauciflora is abundant on rocky hillsides among pinon-juniper forests. It was collected widely on such hillsides overlooking a stream bed in Cedro Canyon seven miles south of U. S. Highway 66 on State

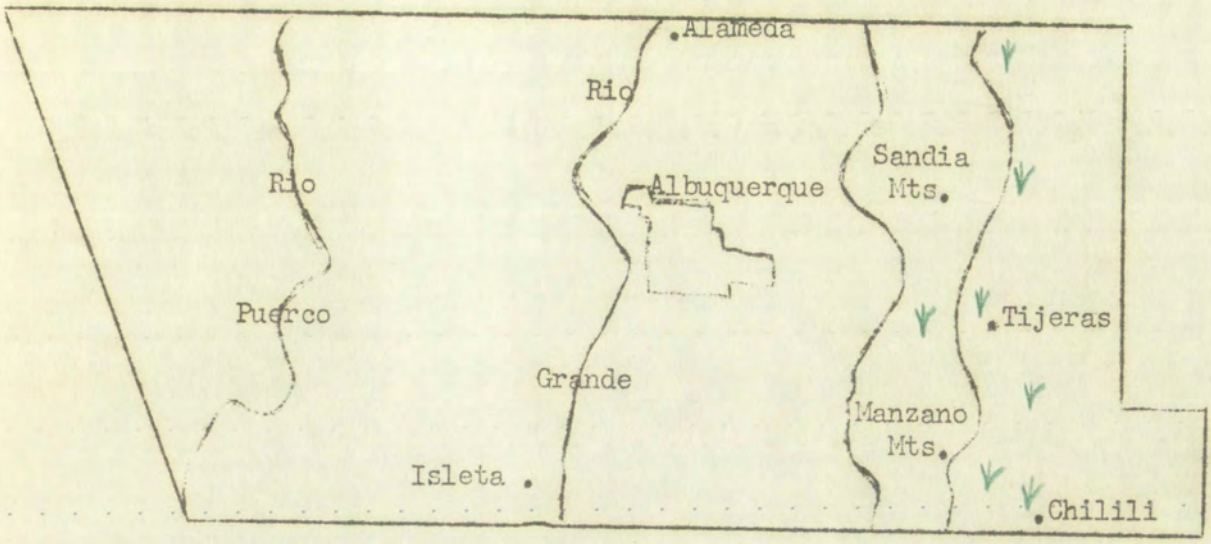

Fig. 17 Distribution of Muhlenbergia pauciflora

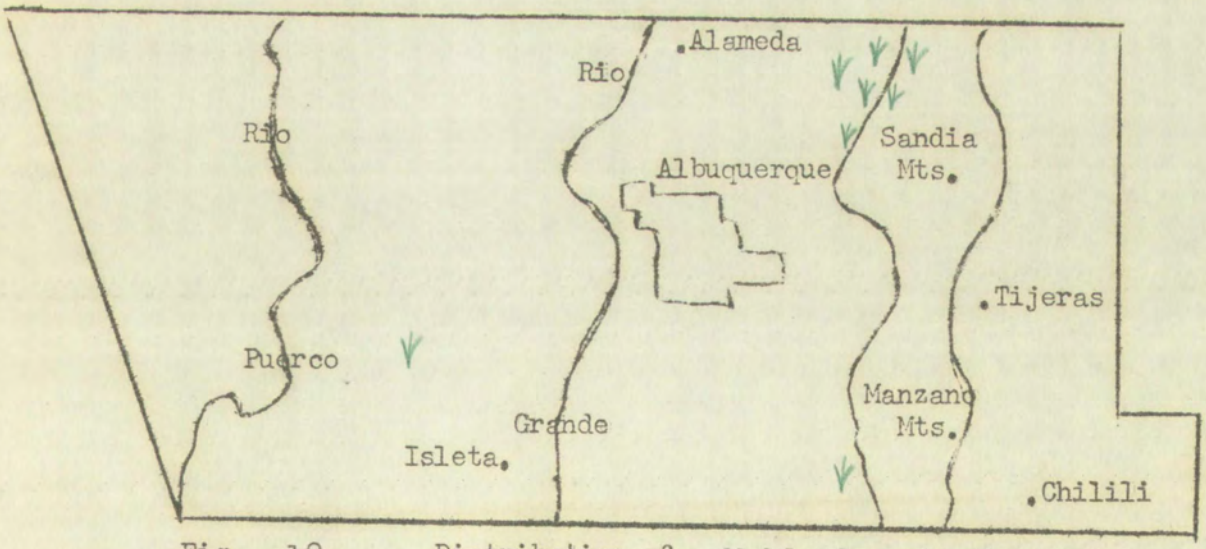

Fig. 18 Distribution of Muhlenbergia Porteri

Highway 10.

Selected synonyms: Muhlenbergia sylvatica var. Pringlei Scribn., Torrey Bot. Club Bul. 9:89. 1882.

Muhlenbergia neo-mexicana Vasey, Bot. Gaz. 11:337. 1886.

Muhlenbergia Pringlei Scribn. in Vasey, U. S. Natl. Herb. Contrib. 3:71. 1892.

. . . . . .

Muhlenbergia Porteri Scribn. in Beal, Grasses N. Amer. 2:259. 1896. BUSH MUHLY, MESQUITE GRASS, HOE GRASS.

M. Porteri was collected from among large rocks and scrub bushes five and one-half miles east of U. S. Highway 85 and one-fourth mile south of the Sandoval-Bernalillo County Line at an elevation of 6,500 feet. The panicle is maroon-purple and may break off to form a tumbleweed. This grass was one of the most abundant when the white man first began to settle in the Southwest. Today, in seeding denuded areas, M. Porteri gives promising results. Bush muhly is a common inhabitant of rocky hills and rocky mesas, usually growing in the protection of shrubs.

Selected synonyms: Muhlenbergia texana Thurb.; Port. and Coult., Syn. Fl. Colo. 144. 1874.

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Podosaemum Porteri Bush,

Amer. Midl. Nat. 7:36. 1921.

Muhlenbergia racemosa (Michx.) B. S. P., Prel. Cat.

N. Y. 67. 1888. MARSH MUHLY.

M. racemosa was collected from an irrigated, shaded area at 22 Los Arboles Road in Albuquerque. It is an eastern grass that has spread to many parts of the country. It is found in a wide variety of habitats, but usually requires an ample supply of water, as it is not a drought resistant grass. It thrives along streams, ditches, and moist canyon bottoms.

Selected synonyms: Agrostis racemosa Michx., Fl. Bor. Amer. 1:53. 1803.

Muhlenbergia glomerata var. ramosa Vasey, Grasses U. S. Descr. Cat. 40. 1885.

Muhlenbergia Richardsonis (Trin.) Rydb., Torrey Bot.

Club Bul. 32:600. 1905. MAT MUHLY.

M. Richardsonis is a small, spindly perennial with creeping rhizomes that grows in gray, loamy soil on rocky hillsides in association with M. pauciflora and Oryzopsis micrantha in pinon-juniper forests. It

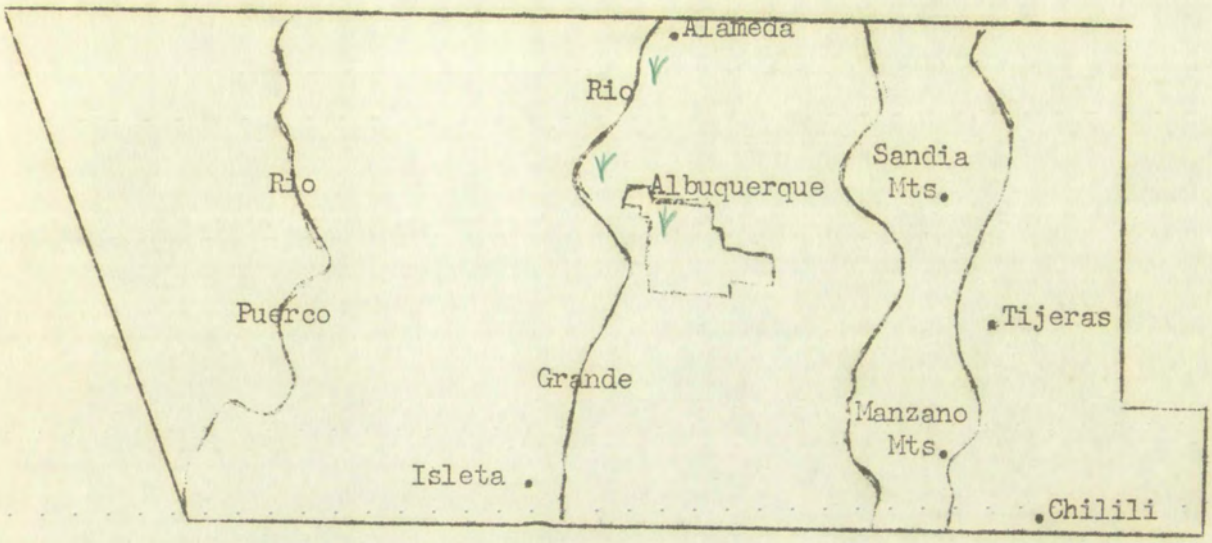

Fig. 19 Distribution of Muhlenbergia racemosa

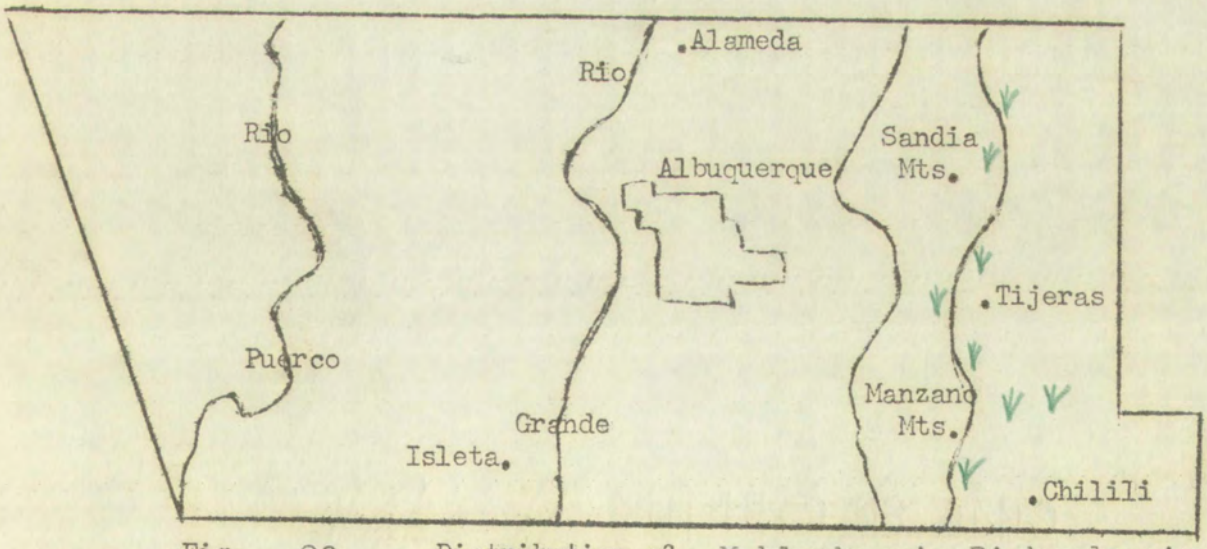

Fig. 20 Distribution of Muhlenbergia Richardsonis

was collected on a rocky hillside overlooking a stream bed in Cedro Canyon six miles south of U. S. Highway 66 on State Highway 10.

Selected synonyms: Vilfa Richardsonis Trin., Acad. St. Petersb. Mem. VI. Sci. Nat. 4:103. 1840.

Muhlenbergia squarrosa (Trin.) Rydb. Torrey Bot. Club. Bul. 36:531. 1909.

. . . . . .

Muhlenbergia Torreyi (Kunth) Hitch. ex Bush, Amer. Midl. Nat. 6:84. 1919. RINGGRASS.

M. Torreyi is found in dry, sandy soil such as is found on either the East or West Mesa of Bernalillo County. It is called ringgrass due to the mann in which it grows. As the basal clump grows and spreads, its center dies, forming a hollow ring. Ringgrass has little or no value as a forage grass and its presence usually indicates an overgrazed condition. It is found in association with M. arenicola, Bouteloua barbata, Bouteloua eriopoda and Salsola pestifer. It has been collected along the south edge of Bear Canyon Arroyo eight miles east of U. S. Highway 85 and five and one-half miles north of U. S. Highway 66.

Selected synonyms: Agrostis Torreyi Kunth, Rev. Gram. 1:Sup. 17. 1830.

. . . . . .

Muhlenbergia gracillima

Torr., U. S. Expl. Mies. Pacif. Rpt. 4:155. 1857.

Muhlenbergia Wrightii Vasey in Coulter, Man. Rocky Mount. 409. 1885. SPIKE MUHLY.

M. Wrightii is usually found on rocky, sparsely wooded hills at elevations from 6,000 to 9,000 feet. In general appearance it may be confused with Lycurus phleoides because of its gray-black spikelike panicle, of M. Wrightii is usually longer and more interrupted. M. Wrightii is not as abundant nor has it the forage value of L. phleoides. It was collected on dry hillsides of Tijeras Canyon ten miles east of U. S. Highway 85.

Selected synonyms: Muhlenbergia Wrightii var. annulata Vasey, Grasses U. S. Descr. Cat. 41. 1885.

Muhlenbergia coloradensis

Mez, Repert. Sp. Nov. Fedde 17:213. 1921.

Oryzopsis Michx. RICEGRASS.

Spikelets 1-flowered, in narrow panicles, disarticulating above the glumes; glumes nearly equal usually longer than the floret; lemma indurate, cylindrical, often pubescent, with a simple or bent, deciduous awn;

Muhlenbergia grandiflora

Torr., U. S. Expl. Wilkes. Pacif. Rpt. 4:193. 1857.

Muhlenbergia Wrightii Vasey in Coulter, Bull. Torrey Botanical Club. 1885. 12:109. Syn. MONLX.

M. Wrightii is usually found on rocky, heavily wooded hills at elevations from 5,000 to 9,000 feet. In general appearance it may be confused with Muhlenbergia phleoides because of its gray-black spikelike panicles. M. Wrightii is usually larger and more luxuriant. M. Wrightii is not as abundant nor has it the value of M. phleoides. It was collected on dry hillsides of Tijeras Canyon ten miles east of U. S. 66.

Selected synonym: Muhlenbergia Wrightii var. annulata Vasey, Contrib. U. S. Nat. Herb. 1:12. 1892.

Muhlenbergia colorandensis Hitchc. Report. Sp. Nov. Proc. Wash. 17:217. 1915.

Gyrenoble Hack. Phil. 1:90.

Spikelets 1-flowered, in narrow panicles, distantly branching above the slender stems. Nerve-veined usually longer than the floret; lemma linearis, erect, 1-3 mm. often puberulent, with a bunch of hairs, equalling awn;

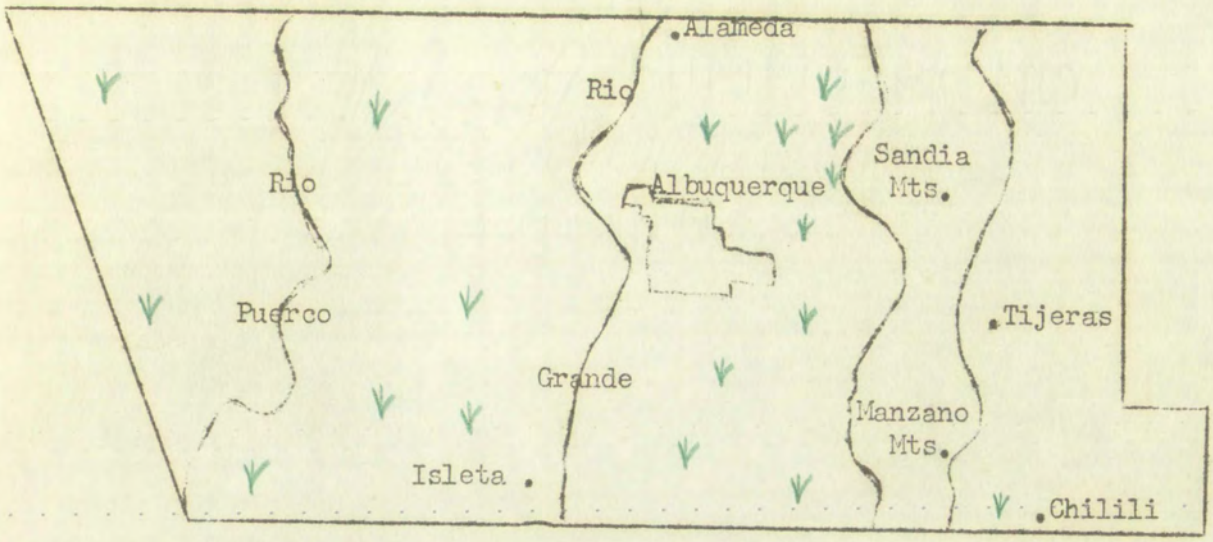

Fig. 21 Distribution of Muhlenbergia Torreyi

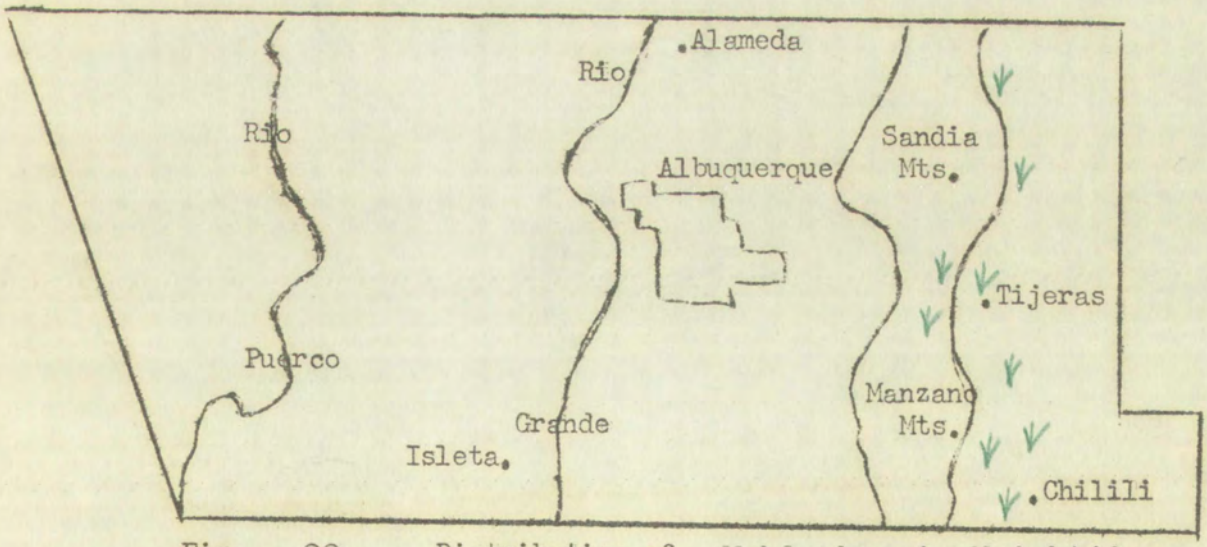

Fig. 22 Distribution of Muhlenbergia Wrightii

floret with a short, blunt callus; mostly tufted perennials. The name comes from Greek oruza meaning rice, and opsis meaning appearance, referring to a superficial resemblance to rice.

Key to species of Oryzopsis

Lemma glabrous, usually less than 3 mm. long ---------- O. micrantha
Lemma villous, usually more than 3 mm. long
  Panicle broad, divaricate; lemma 3 to 4 mm. long, awn 3 to 4 mm. long ---------- O. hymenoides
  Panicle narrow, contracted; lemma 7 to 8 mm. long, awn 12 to 20 mm. long ---------- O. Bloomeri

Oryzopsis Bloomeri (Boland.) Ricker in Piper, U. S. Natl. Herb. Contrib. 11:109. 1906. BLOOMER'S RICEGRASS.

O. Bloomeri is an inhabitant of dry, rocky hills and is found in association with such grasses as O. micrantha, Muhlenbergia Richardsonis, M. pauciflora, and other species of Oryzopsis and Stipa. Work done by investigators concludes that specimens identified as O. Bloomeri are probably hybrids between O. hymenoides and Stipa viridula or Stipa occidentalis (Johnson and Rogler, 1943 and Johnson, 1945). O. Bloomeri was collected on wooded hillsides three and one-half miles

south of U. S. Highway 66 on State Highway 10 at the junction of Otero and Cedro Canyons.

Selected synonyms: Stipa Bloomeri Boland., Calif. Acad. Sci. Proc. 4:168. 1872.

Oryzopsis caduca Beal, Bot. Gaz. 15:111. 1890.

Stiporyzopsis caduca B. L. Johnson and Rogler, Amer. Jour. Bot. 30:55. f. 10, 14, 28-33. 1943.

Stiporyzopsis Bloomeri B. L. Johnson, Amer. Jour. Bot. 32:602. f. 14-18. 1945.

Oryzopsis hymenoides (Roem. and Schult.) Ricker in Piper, U. S. Natl. Herb. Contrib. 11:109. 1906. INDIAN RICEGRASS, SAND BUNCHGRASS.

O. hymenoides is abundant in open, sandy soil. It is common in Albuquerque in waste places such as sandy borders of golf courses, parks, and lawns. It is a valuable forage grass, as both culms and grain are utilized for food by livestock. Indians formerly ground the plump grains to make flour for bread. Indian ricegrass was collected from sandy soil at the edge of the University of New Mexico golf course. It is not a good erosion control grass as it grows in widely scattered

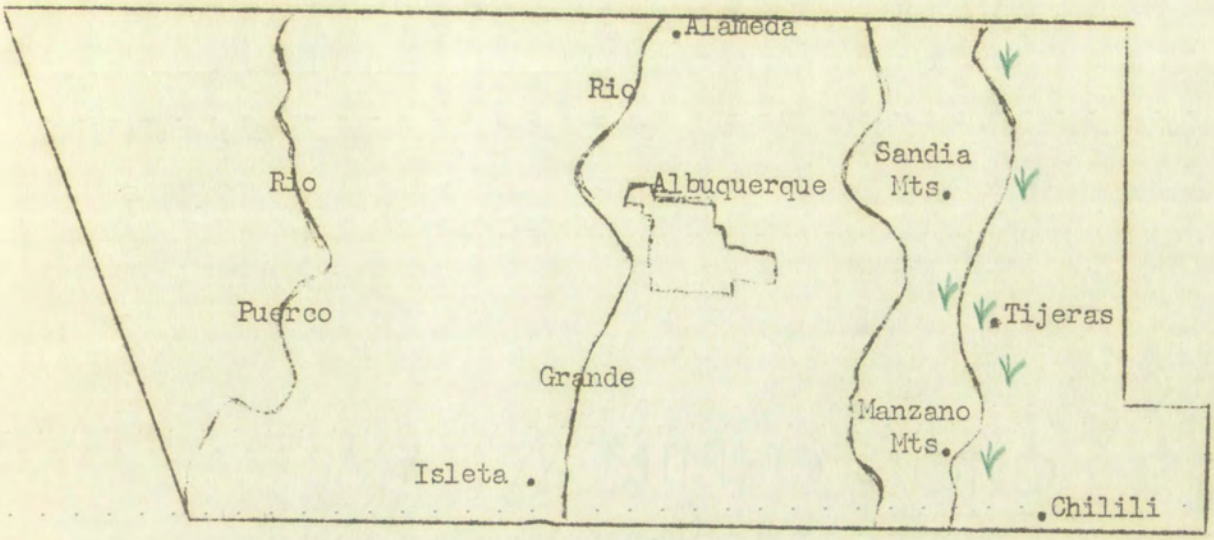

Fig. 23 Distribution of Oryzopsis Bloomeri

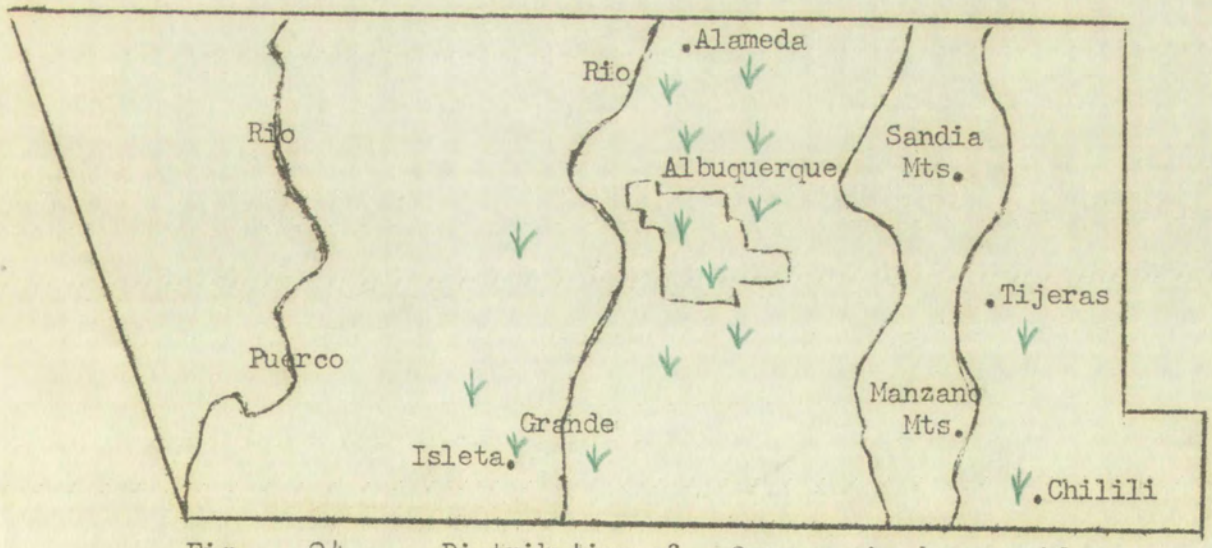

Fig. 24 Distribution of Oryzopsis hymenoides

clumps.

Selected synonyms: Stipa membranacea Pursh, Fl. Amer. Sept. 2:728. 1814.

Stipa hymenoides Roem. and Schult., Sept. Veg. 2:339. 1817.

Fendleria rhynchelytroides Steud., Syn. Pl. Glum. 1:420. 1854.

Oryzopsis cuspidata Benth. ex Vasey, Grasses U. S. 23. 1883.

Eriocoma hymenoides Rydb., Torrey Bot. Club Bul. 39:102. 1912.

Oryzopsis micrantha (Trin. and Rupr.) Thurb., Acad. Natl. Sci. Phila. Proc. 1863:78. 1863. LITTLESEED RICEGRASS.

O. micrantha is found on rocky, wooded hillsides often in pinon-juniper forests. A specimen was collected three and one-half miles south of U. S. Highway 66 on State Highway 10 at the junction of Otero and Cedro Canyons.

Selected synonyms: Urachne micrantha Trin. and Rupr., Acad. St. Petersb. Mem. VI. Sci. Nat. 5:16. 1842.

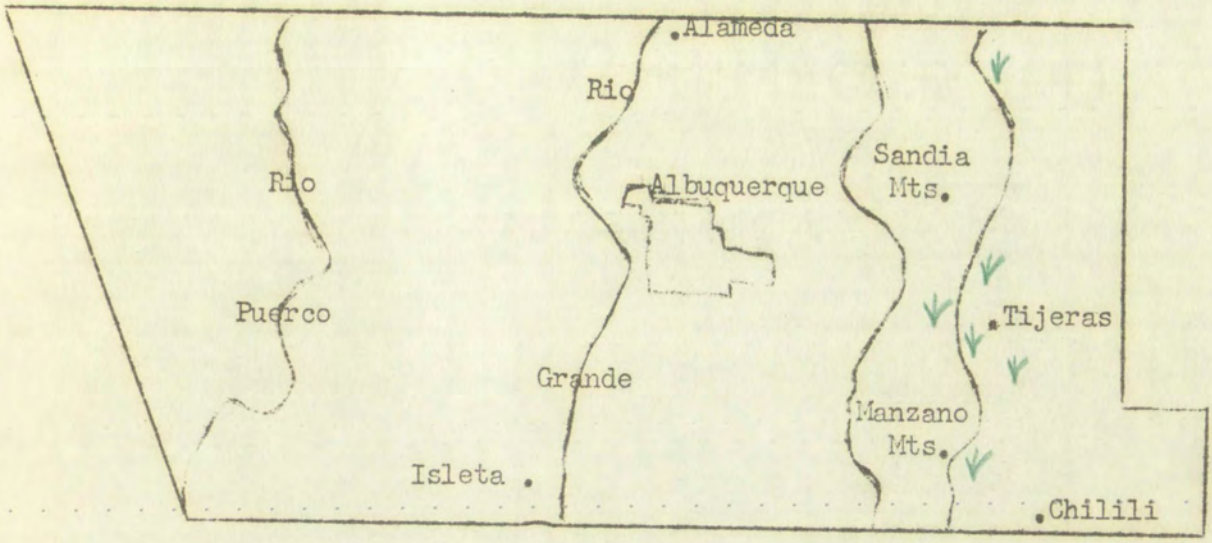

Fig. 25 Distribution of *Oryzopsis micrantha*

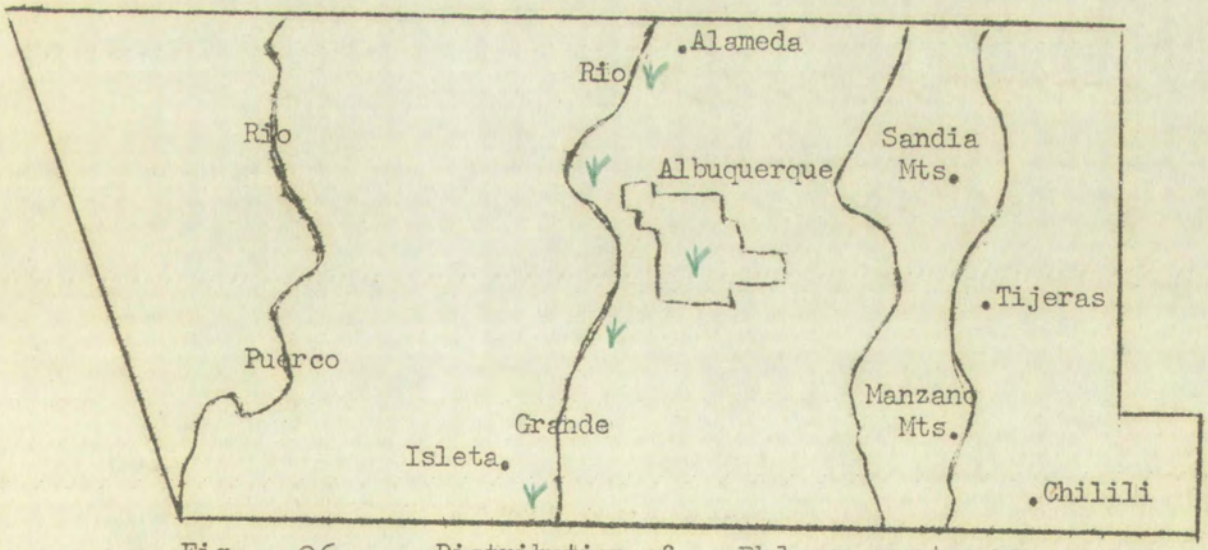

Fig. 26 Distribution of *Phleum pratense*

Phleum L. TIMOTHY.

Spikelets 1-flowered, disarticulating above the glumes; glumes equal, acuminate to awned; spikelets laterally compressed; lemma and palea shorter than glumes, hyaline, awnless; blades glabrous and flat; annuals and perennials; panicle spikelike and cylindrical. The name is derived from the Greek phleos, meaning marsh reed.

Phleum pratense L., Sp. Pl. 59. 1753. TIMOTHY, HERD'S GRASS.

P. pratense, commonly referred to as timothy, is found in this county in moist, waste places near cultivated areas. This species is cultivated as a hay crop in many parts of the country but is not a natural inhabitant of the Southwest. It was collected from the University of New Mexico campus lawn in front of the Administration Building.

Selected synonyms: Stelephurus pratensis Lunell, Amer. Midl. Nat. 4:216. 1915.

Polypogon Desf.

Spikelets 1-flowered, disarticulating abruptly below the glumes forming a sharp callus at base of spikelet; spikelets laterally compressed; glumes equal,

each bearing long, slender awns or at least awn tipped; lemma hyaline, much shorter than glumes, usually bearing a short delicate awn; annuals or perennials. The generic name Polypogon comes from the Greek polus meaning much, and pogon meaning beard, referring to the tawny, bearded appearance of the inflorescence caused by the many awns coming from the glumes.

Polypogon monspeliensis (L.) Desf., Fl. Atlant. 1:67. 1798. RABBITFOOT GRASS.

P. monspeliensis is called rabbitfoot grass because the spikelike panicle resembles a rabbit's foot. It grows abundantly along irrigation ditches commonly in association with Hordeum jubatum and Agrostis semiverticillata. It was collected at the edge of Albuquerque Riverside Drain northwest of the intersection of U. S. Highway 85 and State Highway 47 one mile north of Alameda.

Selected synonyms: Alopecurus monspeliensis L., Sp. Pl. 61. 1753.

Agrostis alopecuroides Lam., Tabl. Encycl. 1:160. 1791.

Polypogon crinitus Nutt., Gen. Pl. 1:50. 1818.

each bearing long, slender ears or wattles on the ground; lemma hyaline, much shorter than palmae, usually bearing a short delicate awn; annuals or perennials. The genus name Polypogon comes from the Greek πολυς meaning many, and πωγων meaning beard, referring to this genus' dense appearance of the inflorescence caused by the many awns coming from the glumes.

Polypogon monspeliensis (L.) Desf., Fl. Atlant. 1:57. 1798. Beard-grass.

P. monspeliensis is quite variable and this species becomes the equivalent particle readily in a habitat's flora. It grows abundantly along irrigation ditches commonly in association with Hordeum jubatum and Juncus balticus subsp. ?. It was collected at the edge of Albuquerque airport's parking lot northwest of the intersection of U. S. Highway 66 and State Highway 47 one mile north of Alameda.

Selected synonyms: Alopecurus monspeliensis L., Sp. Pl. 60. 1753.

Agrostis alopecuroides Lam., Tabl. Encycl. 1:166. 1791.

Polypogon antarcticus Nees, Gen. Pl. 1:20. 1838.

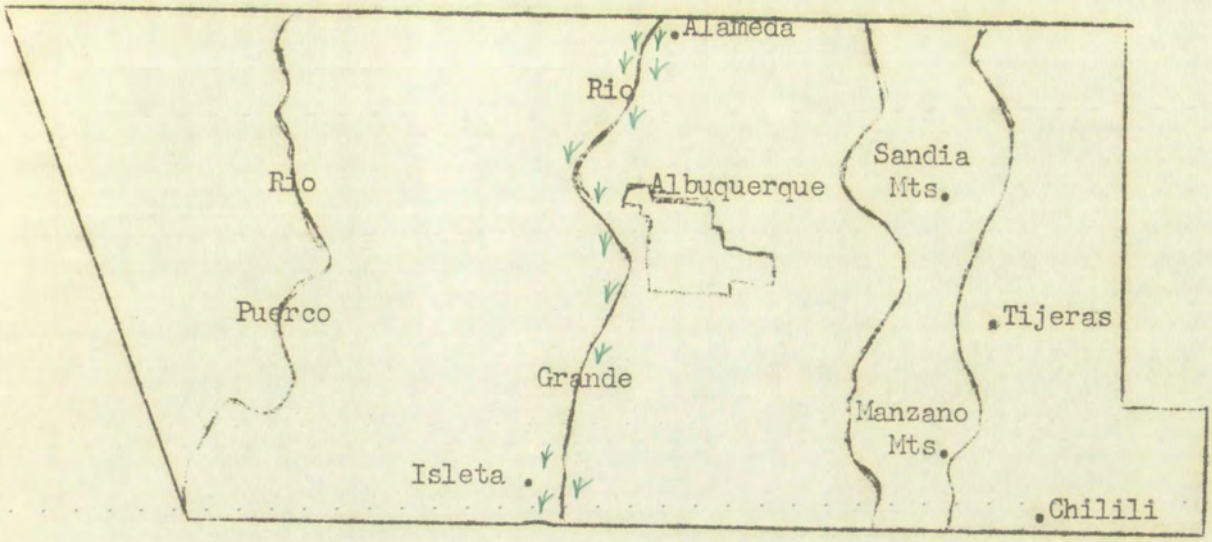

Fig. 27 Distribution of Polypogon monspeliensis

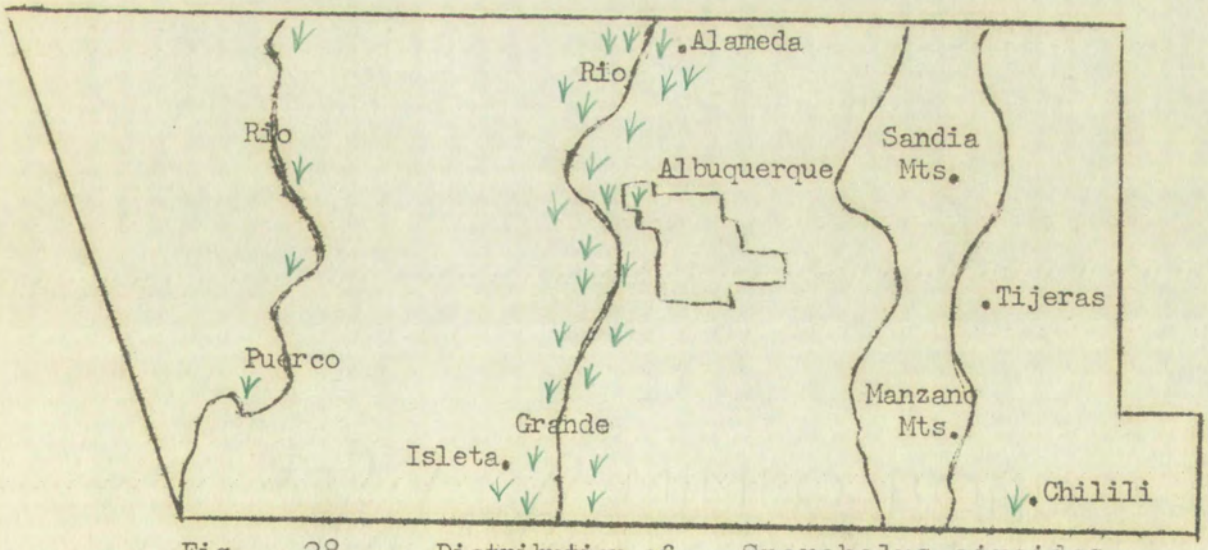

Fig. 28 Distribution of Sporobolus airoides

Sporobolus R. Br. DROPSEED.

Spikelets 1-flowered, disarticulating above the glumes, glumes unequal, second often as long as the floret; lemma 1-nerved, awnless; inflorescence varies from an open to a spikelike panicle; caryopsis enclosed loosely by lemma and palea, usually falling from spikelet at maturity; pericarp of caryopsis free from the seed coat; mostly perennials. The generic name comes from the Greek spora, meaning seed, and ballein, to throw, referring to the "dropseed" habit of this genus.

Key to species of Sporobolus

Panicle narrow, spikelike

Annuals----------S. neglectus

Perennials

Culms usually more than 1 M. tall; spikelets 3 mm. or longer----------S. giganteus

Culms usually less than 1 M. tall; spikelets usually less than 3 mm. long----------S. contractus

Panicle open, not spikelike

Panicle branches divaricate; summit of sheath almost devoid of pubescence----------S. airoides

Panicle branches not divaricate; summit of sheath with a conspicuous ring of long, white hairs-S. cryptandrus

Sporobolus airoides (Torr.) Torr., U. S. Rpt. Expl. Miss. Pacif. 7:21. 1856. ALKALI SACATON, ALKALI GRASS.

S. airoides is one of the most abundant grasses of the sandy, alkaline bottomlands which are common near river beds in the Southwest. It has been collected from the sandy banks of the Albuquerque Main Canal three-fourths of a mile west of U. S. Highway 85 toward the Alameda bridge and also in alkaline soil near irrigation ditches two miles south of Isleta Pueblo. It is much more resistant to alkali than other species of Sporobolus and constitutes a major portion of available hay-grass in dry years.

Selected synonyms: Agrostis airoides Torr., Ann. Lyc. N. Y. 1:151. 1824.

Sporobolus diffusissimus Buckl., Acad. Nat. Sci. Phila. Proc. 1862:90. 1862.

Sporobolus contractus Hitchc., Amer. Jour. Bot. 2:303. 1915. SPIKE DROPSEED.

S. contractus closely resembles S. cryptandrus. It differs primarily in having a contracted, spikelike panicle. Spike dropseed is a common inhabitant of open, sandy, ground in Albuquerque. It was collected in Bear

Sporobolus airoides (Torr.) Torr., U. S. Dept. Agri. Bureau. Prod. 7:21. 1896. Al Alkali Sacaton, Alkali Grass.

3. *airoides* is one of the most abundant grasses of the sandy, alkaline bottomlands which are bounded by river beds in the Southwest. It has been collected from the sandy banks of the Albuquerque Main Canal three-fourths of a mile west of U. S. Highway 85 toward the Alameda bridge and also in alkaline soil near irrigation ditches two miles south of Isleta Pueblo. It is much more resistant to alkali than other species of *Sporobolus* and constitutes a major portion of available hay-grass in dry years.

Selected synonyms: *Agrostis airoides* Torr., Ann. Lyc. N. Y. 3:151. 1834.

Sporobolus cliffordianus Swall., Acad. Nat. Sci. Phila. Proc. 1892:90. 1892.

Sporobolus contractus Hitchc., Amer. Jour. Sci. 21:503. 1915. Spike Dropseed.

3. *contractus* closely resembles 4. *cryptandrus*. It differs primarily in having a contracted, spikelike panicle. Spike dropseed is a common inhabitant of open, sandy, ground in Albuquerque. It was collected in deep

Canyon Arroyo six miles east of U. S. Highway 85 and four and one-half miles north of U. S. Highway 66, growing in association with Bouteloua curtipendula.

Selected synonyms: Sporobolus cryptandrus var. strictus Scribn., Torrey Bot. Club Bul. 9:103. 1882.

Sporobolus strictus Merr., U. S. Dept. Agr., Div. Agrost. Cir. 32:6. 1901.

Sporobolus cryptandrus (Torr.) A. Gray, Man. 576. 1848.

SAND DROPSEED.

S. cryptandrus is one of the most common weeds found in empty lots and other waste places in Albuquerque. It closely resembles S. contractus but lacks the contracted, spikelike panicle. It is much more drought resistant than is S. airoides and is common on flat, dry mesas. It grows in scattered bunches, therefore, it is of little value as a soil binder, but it is highly palatable and withstands grazing very well. Sand dropseed was collected from the grounds of St. Joseph's College four miles west of U. S. Highway 85 and one mile north of U. S. Highway 66.

Selected synonyms: Agrostis cryptandra Torr., Ann. Lyc. N. Y. 1:151. 1824.

Vilfa cryptandra Torr. ex Trin., Acad. St. Petersb. Mem. VI Sci. Nat. 4:69. 1840.

Canyon Arroyo six miles east of [illegible], [illegible] four and one-half miles north of U. S. Highway 66, growing in association with Bouteloua curtipendula.

Selected synonym: Sporobolus cryptandrus (Torr.) Atwater Scribn., Torrey Bot. Club Bull. 9:120. 1882.

Boeberoa cryptandra Nutt.

U. S. Dept. Agri., Div. Agrost. Cir. 32:6. 1901.

Sporobolus cryptandrus (Torr.) A. Gray, Am. Jour. Sci. 1848.

SAND DROPSEED.

4. cryptandrus is one of the most common weeds found in sandy lots and other waste places in Albuquerque. It closely resembles S. contractus but lacks the contracted, spikelike panicle. It is much more drought resistant than is S. airoides and is common particularly, dry mesas. It grows in scattered bunches, but it is not [illegible] and [illegible] a soil binder, but it is [illegible] and [illegible] growing very well. Some [illegible] were collected from the grounds of St. Joseph's Hospital four miles east of U. S. Highway 85 and one mile north of U. S. Highway 66.

Selected synonym: Agrostis cryptandra Torr., Ann. Lyc. N. Y. 1:121. 1824.

Vilfa cryptandra Torr. ex Trin., Acad. Sci. Petersb. Mem. VI Sci. Nat. 4:139. 1840.

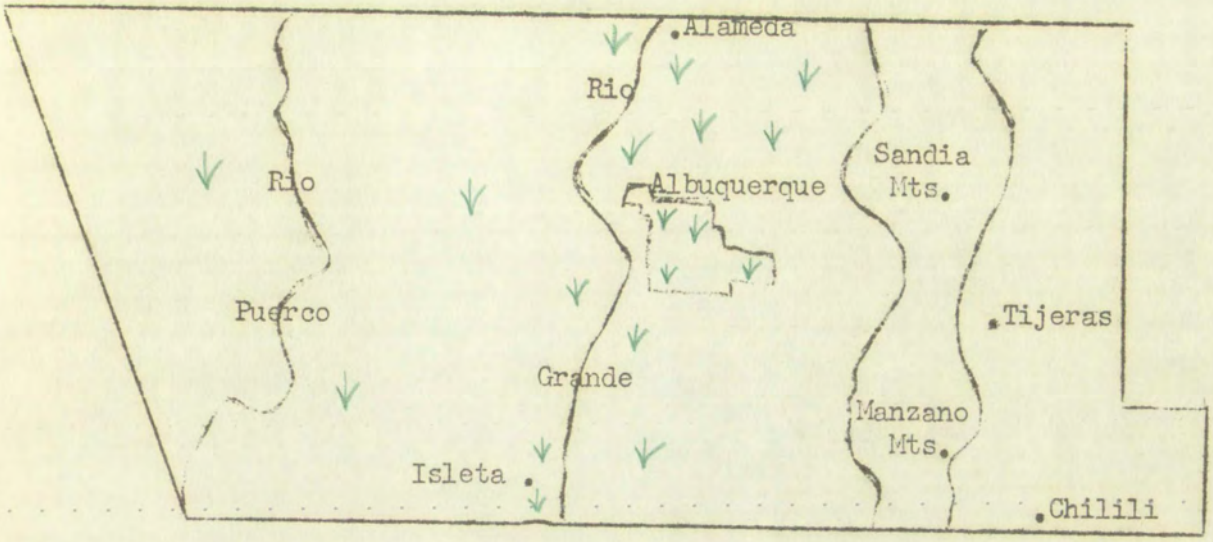

Fig. 29 Distribution of Sporobolus contractus

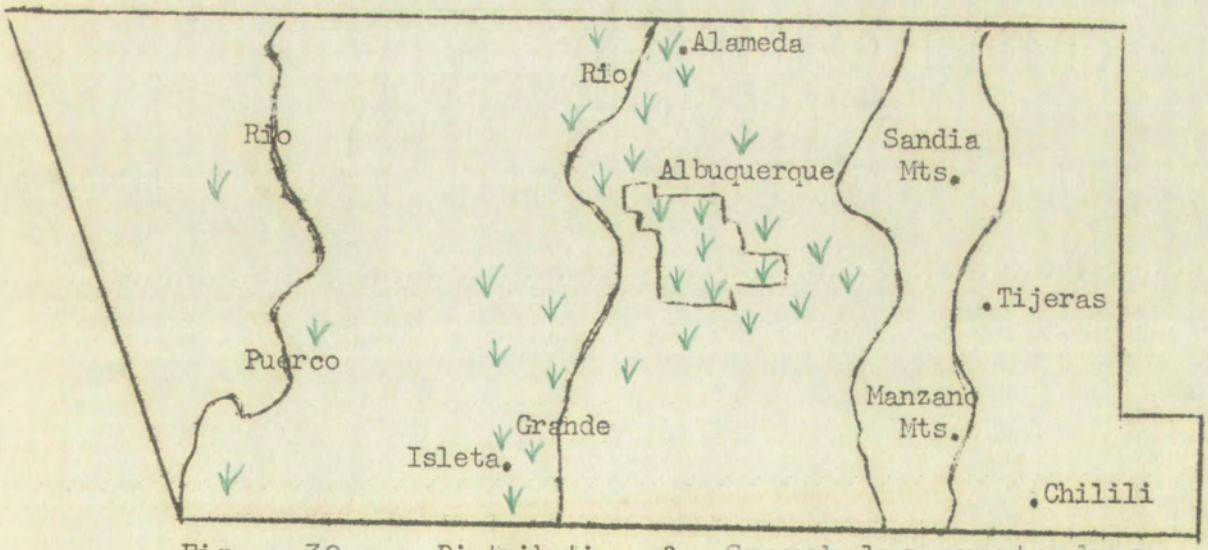

Fig. 30 Distribution of Sporobolus cryptandrus

Sporobolus giganteus Nash, Torrey Bot. Club. Bul. 25:88. 1898. GIANT DROPSEED.

S. giganteus is similar to S. contractus but is consistently taller, with longer panicle, larger spikelets and thicker culms. This species was collected at the roadside of U. S. Highway 66 five miles west of U. S. Highway 85. Giant dropseed inhabits sand dunes and sandy mesas, particularly along arroyos.

Selected synonyms: Sporobolus cryptandrus var. robustus Vasey, U. S. Natl. Herb. Contrib. 1:56. 1890.

Sporobolus cryptandrus var. giganteus Jones, West. Bot. Contrib. 14:11. 1912.

Sporobolus neglectus Nash, Torrey Bot. Club Bul. 22:464. 1895.

S. neglectus grows in sandy soil but is not a common inhabitant of the southwestern ranges. A specimen was collected from an irrigated, heavily overgrown area at 22 Los Arboles Road in Albuquerque.

Selected synonyms: Sporobolus vaginiflorus var. neglectus Scribn., U. S. Dept. Agr., Div. Agrost. Bul. 17 (ed. 2):170. f. 466. 1901.

Sporobolus ozarkanus Fernald, Rhodora 35:109. 1933.

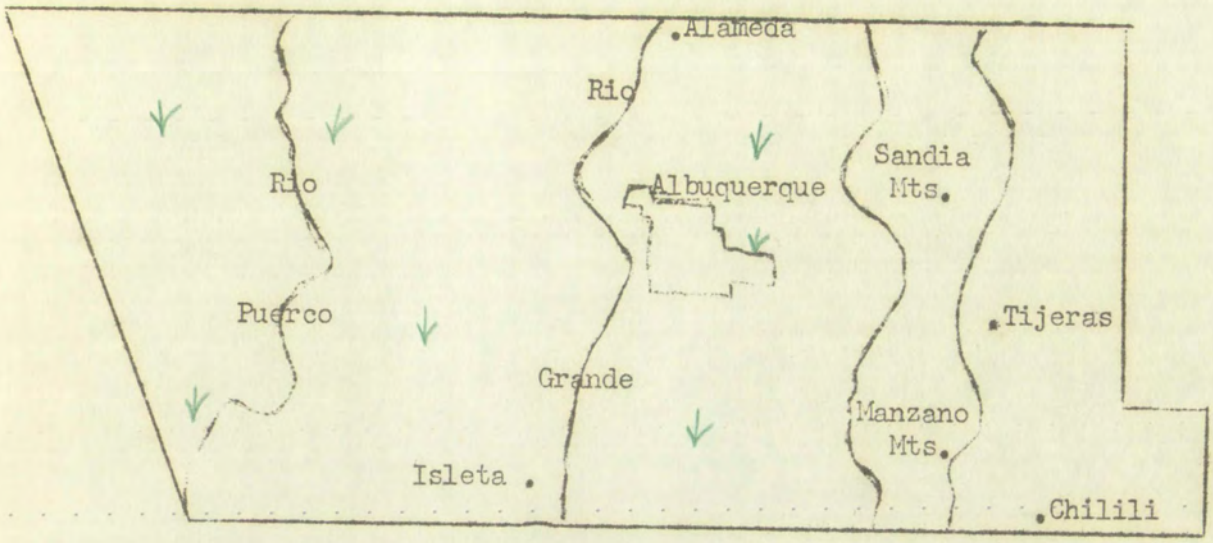

Fig. 31 Distribution of Sporobolus giganteus

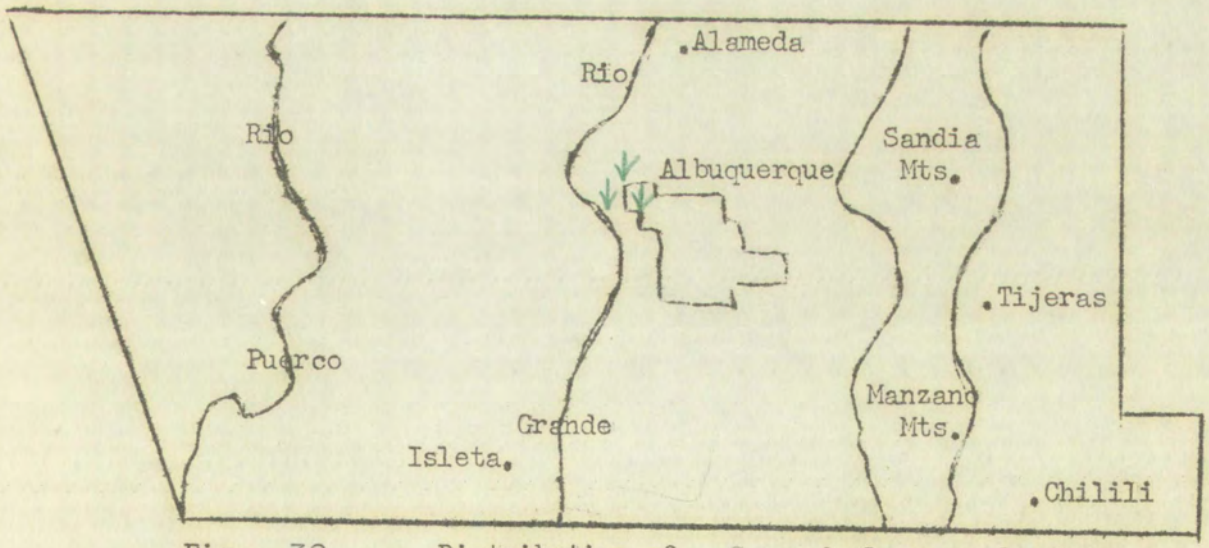

Fig. 32 Distribution of Sporobolus neglectus

Stipa L. NEEDLEGRASS.

Spikelets 1-flowered, disarticulating above the glumes; glumes thin, often hyaline, acute to awn-tipped; lemma terete, indurate, with a sharp-pointed, pubescent callus at base; awn of lemma usually long, twisted, once or twice geniculate, attached to lemma by an evident, swollen joint; inflorescence an open or contracted panicle; perennial bunchgrasses. The name comes from the Greek stupe meaning tow, referring to the feathery appearance of the type species, Stipa pennata L.

Key to species of Stipa

Glumes usually less than 15 mm. long; awn less than 5 cm. long----------S. columbiana

Glumes usually more than 15 mm. long; awn more than 5 cm. long----------S. comata

Stipa columbiana Macoun, Can. Pl. Cat. 2:191. 1888.

COLUMBIA NEEDLEGRASS, SUBALPINE NEEDLEGRASS.

S. columbiana was collected near Kiwanis Point in the Sandia Mountains in an open meadow. The species is seldom found below 7,000 feet elevation in this region and usually inhabits mountain meadows and forest openings.

Selected synonyms: Stipa viridula var. minor Vasey, U. S. Natl. Herb. Contrib. 3:50. 1892.

Stipa minor Scribn., U. S. Dept. Agr., Div. Agrost., Bul. 11:46. 1898.

Stipa Nelsoni Scribn., U. S. Dept. Agr., Div. Agrost. Bul. 11:46. 1898.

Stipa comata Trin. and Rupr., Acad. St. Petersb. Mem. VI. Sci. Nat. 5:75. 1842. NEEDLE-AND-THREAD GRASS.

S. comata was collected among huge boulders in Juan Tabo Canyon five miles east of U. S. Highway 85 and one-fourth mile south of the Sandoval-Bernalillo County Line. This species grows in large clumps and is easily recognized by its long, papery glumes and indurate lemma bearing a long, twisted awn. The sharp-pointed callus of the fruit can be injurious to grazing animals, particularly sheep, by puncturing the skin or penetrating the lining of the mouth when eaten. This same sharp point is advantageous for dispersal of the fruit as it sticks into the ground and gradually works its way deeper into the soil. Needle-and-thread grass usually occupies rocky hillsides in the pinon-juniper forest.

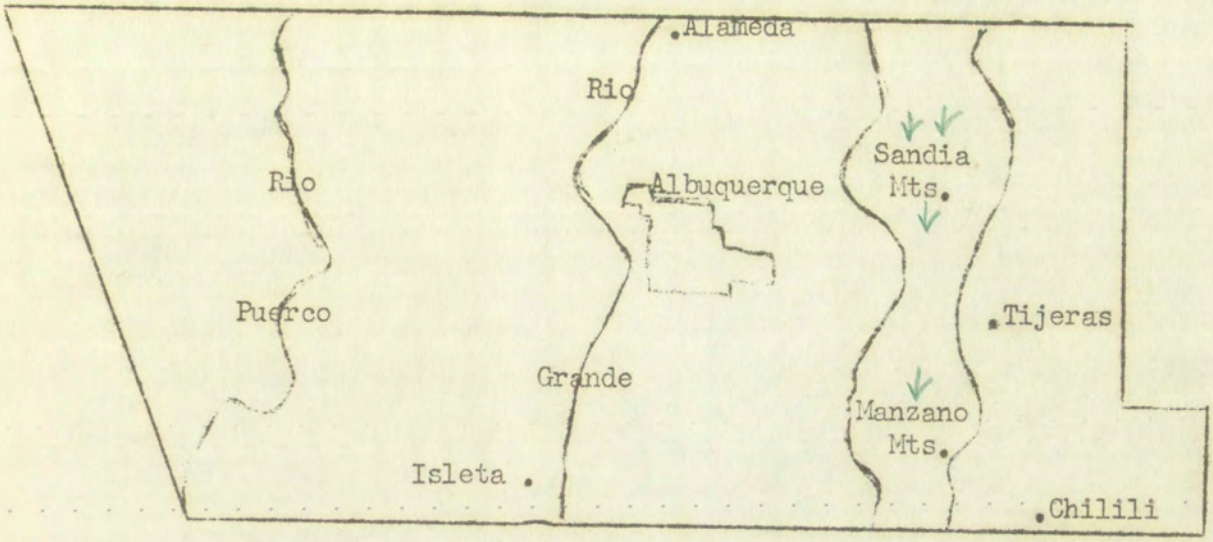

Fig. 33 Distribution of Stipa columbiana

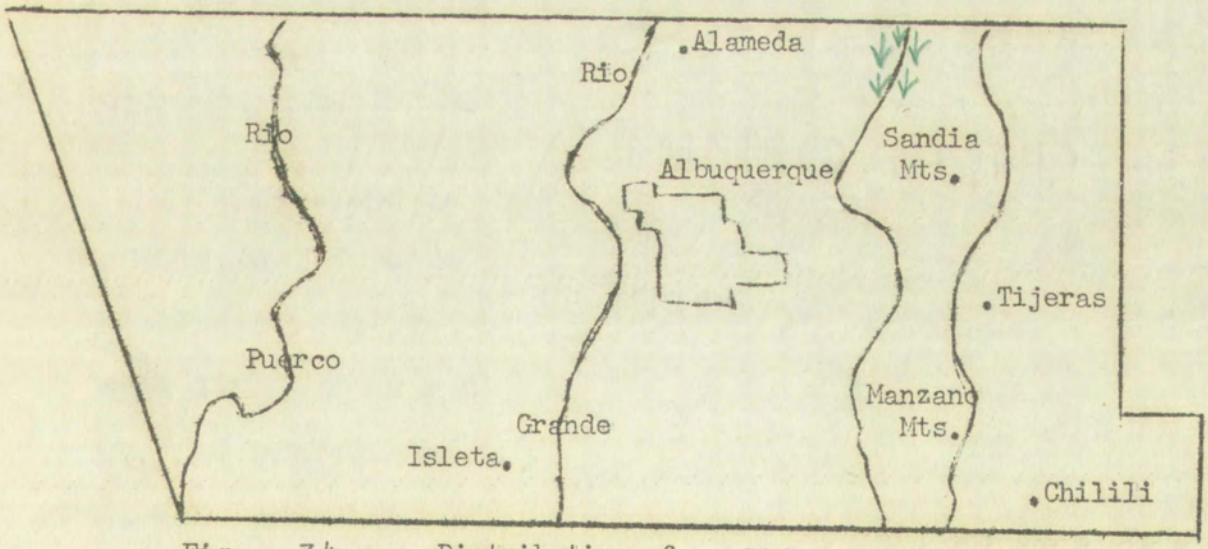

Fig. 34 Distribution of Stipa comata

Selected synonyms: Stipa Tweedyi Scribn., U. S. Dept. Agr., Div. Agrost. Bul. 11:47. 1898.

Stipa spartea var. Tweedyi Jones, West. Bot. Contrib. 14:11. 1912.

Key to the genera of the Andropogoneae

Inflorescence many-jointed with spikelike branches that may be single, digitate, or clustered-----Andropogon

Inflorescence with few jointe and without spikelike branches

Pediceled spikelets staminate, slightly narrower than the perfect, sessile spikelets; awns fugacious; rhizomes present----------Sorghum

Pediceled spikelets reduced to only a pedicel; awns persistent; rhizomes lacking; inflorescence turning yellowish brown at maturity----------Sorghastrum

Andropogon L. BEARDGRASS, TALL SAGE GRASS.

Spikelets in pairs at each joint of the hairy rachis, one sessile and perfect, the other pediceled and staminate, sterile, or rudimentary; glumes of the sessile spikelet obviously different; first glume dorsally compressed with strong lateral nerves and a faint midnerve; second glume laterally compressed; fertile lemma hyaline,

awned; fertile palea hyaline, minute or absent; pediceled spikelet similar to sessile one but usually awnless and sometimes reduced; inflorescence made up of spikelike racemes arranged singly, in pairs, or in clusters on an exserted peduncle; tall perennials. The name comes from the Greek aner meaning man or male and pogon meaning beard, referring to the villous pedicels of the staminate or sterile spikelets.

Key to the species of Andropogon

Racemes solitary on each peduncle----------A. scoparius
Racemes more than one on each peduncle
  Culms villous at the nodes; sessile spikelets more than 5 mm. long; pediceled spikelets more than 3 mm. long A. barbinodis
  Culms not villous at the nodes; sessile spikelets less than 5 mm. long; pediceled spikelets less than 3 mm. long----------A. saccharoides

Andropogon barbinodis Lag., Gen. et Sp. Nov. 3. 1816.

CANE BEARDGRASS.

A. barbinodis was collected at La Cueva Camp Ground near the northeast corner of Bernalillo County. This species grows rather profusely along the roadsides and among the huge boulders in the western foothills of the

awned; fertile palea hyaline, minute or absent; pedicelled spikelet similar to sessile one but usually smaless and sometimes reduced; inflorescence made up of spikelike racemes arranged singly, in pairs, or in clusters on an exserted peduncle; tall perennials. The name comes from the Greek anér meaning man or male and pogon meaning beard, referring to the villous pedicels of the staminate or sterile spikelets.

Key to the species of Andropogon

Racemes solitary on each peduncle----------A. bonpeniana
Racemes more than one on each peduncle
Culms villous at the nodes; sessile spikelets more than 5 mm. long; pedicelled spikelets more than 5 mm. long
A. barbinodis
Culms not villous at the nodes; sessile spikelets less than 5 mm. long; pedicelled spikelets less than 5 mm. long----------A. angustifolius

Andropogon barbinodis Lag., Gen. et Sp. Nov. 3. 1816.
CANE BERPUENAGE.

A. barbinodis was collected at La Nueva Camp Ground near the northeast corner of Bernalillo County. This species grows rather profusely along the roadsides and among the huge boulders in the western foothills of the

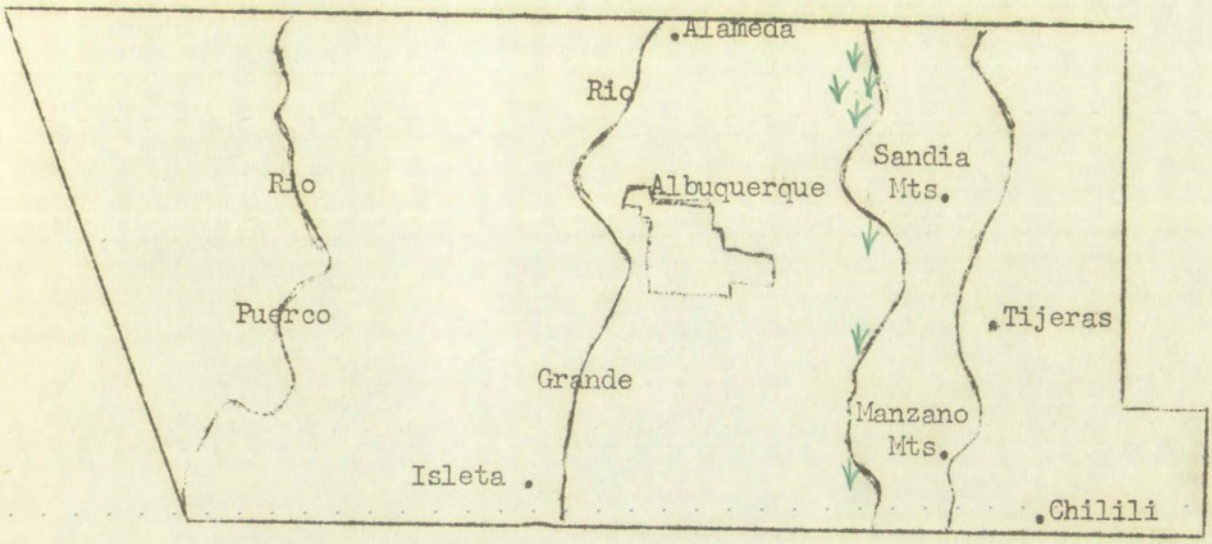

Fig. 35 Distribution of Andropogon barbinodis

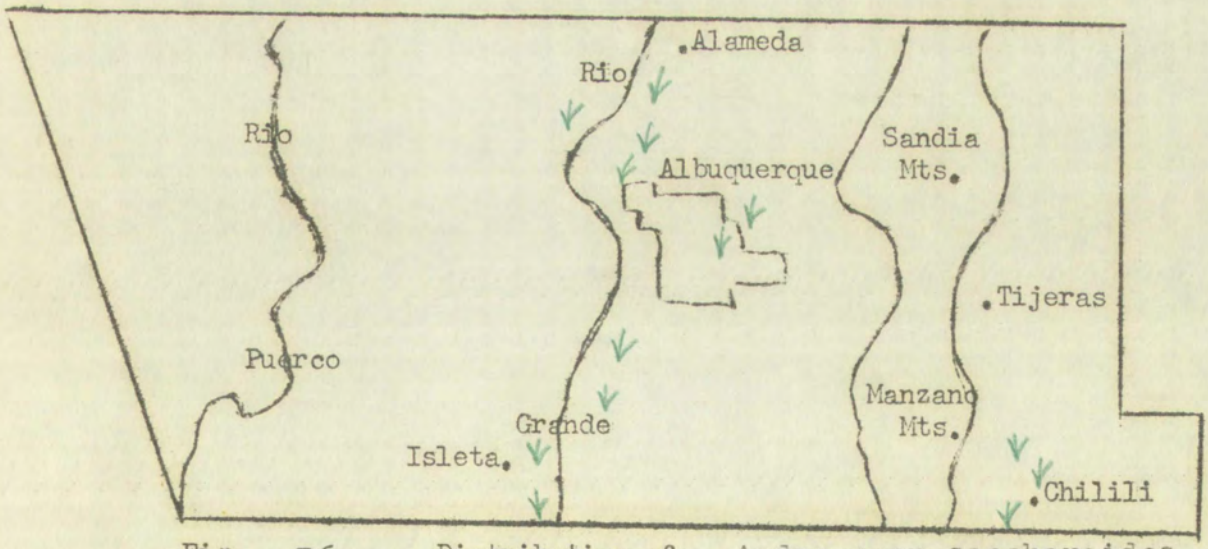

Fig. 36 Distribution of Andropogon saccharoides

Sandia Mountains. When young, cane beardgrass is palatable for livestock, but becomes coarse and tough as it matures. Gould (1951, p. 307) reports first generation hybrids between Andropogon saccharoides and Andropogon barbinodis.

Selected synonyms: Andropogon leucopogon Nees, Linnaea 19:694. 1845.

Amphilophis barbinodis Nash in Small, Fl. Southeast. U. S. 65. 1903.

Amphilophis leucopogon Nash, N. Amer. Fl. 17:126. 1912.

Andropogon saccharoides Swartz., Prodr. Veg. Ind. Occ. 26. 1788. SILVER BEARDGRASS.

A. saccharoides was collected extensively from the borders of the University of New Mexico golf course and from roadside ditches of State Highway 10 near Hubbell Lake, five miles south of U. S. Highway 66. It is a fair soil binder and a good forage grass when young. Silver beardgrass is a common inhabitant of rocky slopes, roadside ditches, and moist, sandy soil.

Selected synonyms: Andropogon glaucus Torr., Ann. Lyc. N. Y. 1:153. 1824.

Andropogon Torreyanus Steud., Nom. Bot. ed. 2. 1:93. 1840.

Amphilophis saccharoides Nash, N. Amer. Fl. 17:125. 1912.

Bothriochloa saccharoides Rydb., Brittonia 1:81. 1931.

Andropogon scoparius Michx., Fl. Bor. Amer. 1:57. 1803.

LITTLE BLUE STEM.

A. scoparius was collected from a rapidly drying stream bed near Sedillo Hill Camp Ground. The stream bed, which lays at the edge of a pinon-juniper forest, apparently had been flooded and the *A. scoparius* began to grow in the moist sand. The stream bed dried rapidly and the grass matured as a stunted or dwarf specimen. All parts of the inflorescence measured almost as large as normally expected but the plant stood only 25 cm. tall, which is definitely below the normal culm length; also the culms and spikelets had a reddish-purple tinge. This species is rare in Bernalillo County as it requires more moisture than normally falls in the region. It is more abundant in eastern New Mexico and is an important range grass of the Great Plains. It normally inhabits pine and juniper forests and mountain meadows.

Selected synonyms: *Schizachyrium scoparium* Nash in Small, Fl. Southeast. U. S. 59. 1903.

Amphiloxia sacchariflora Hash.

N. Amer. Fl. 17:125. 1912.

Batrisochloa sacchariflora

Rydb., Brittonia 1:81. 1931.

Andropogon scoparius Mich., Fl. Bor. Amer. 1:37. 1803.

LITTLE BLUE STEM.

A. scoparius was collected from a rapidly drying stream bed near Sedillo Hill Camp Ground. The stream bed, which lays at the edge of a piñon-juniper forest, apparently had been flooded and the *A. scoparius* began to grow in the moist sand. The stream bed dried rapidly and the grass matured as a stunted or dwarf specimen. All parts of the inflorescence measured almost as large as normally expected but the plant stood only 25 cm. tall, which is definitely below the normal culm length; also the culms and spikelets had a reddish-purple tinge. This species is rare in Bernalillo County as it requires more moisture than normally falls in the region. It is more abundant in eastern New Mexico and is an important range grass of the Great Plains. It normally inhabits pine and juniper forests and mountain meadows.

Selected synonyms: *Schizachyrium scoparium* Nash in Small, Fl. Southeast. U. S. 59. 1903.

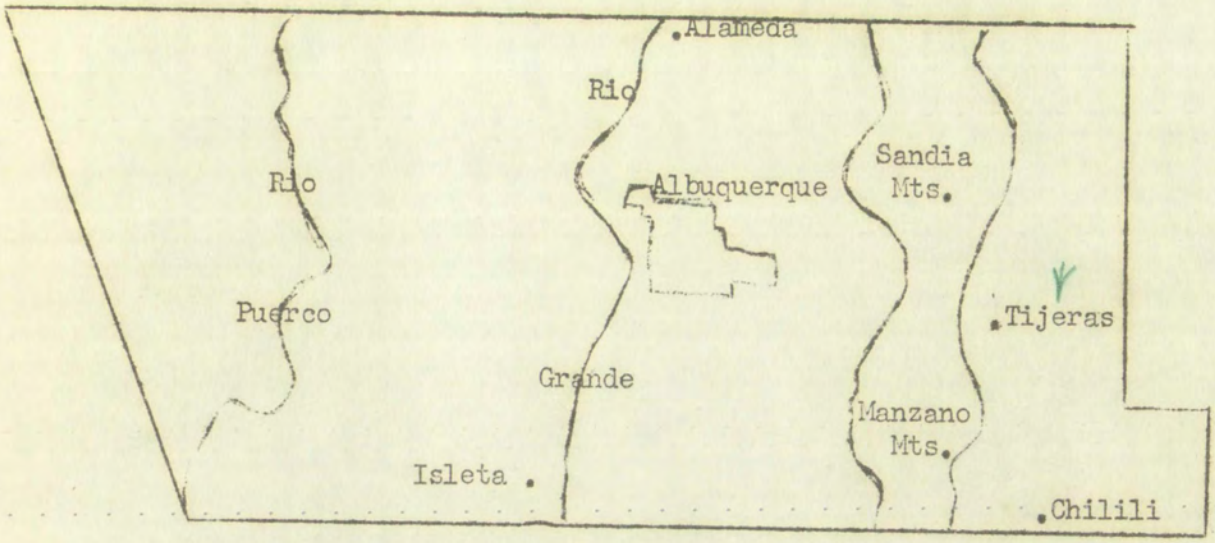

Fig. 37 Distribution of Andropogon scoparius

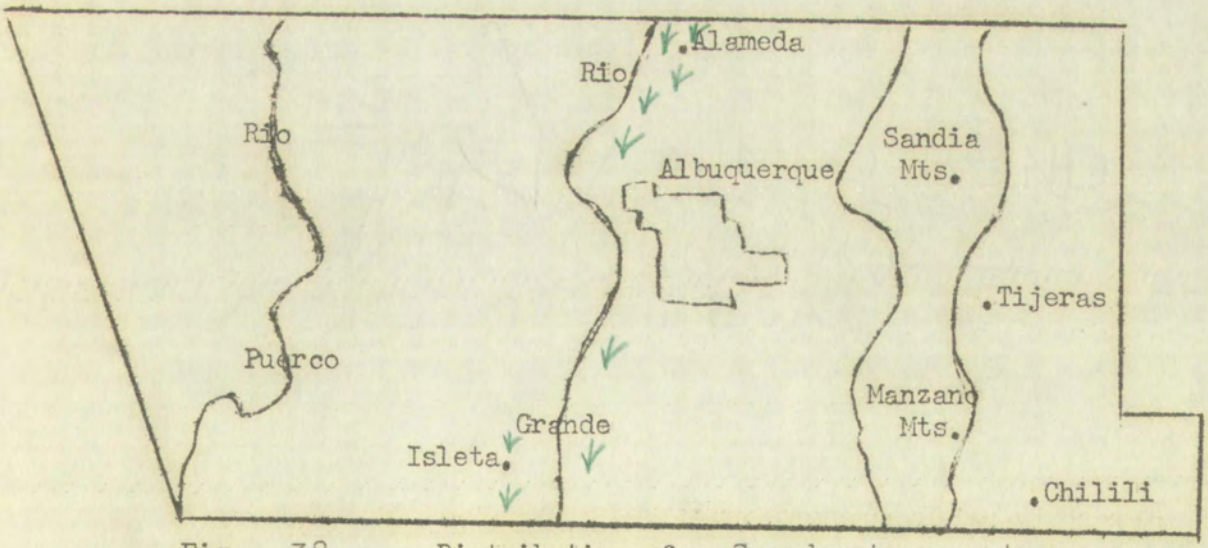

Fig. 38 Distribution of Sorghastrum nutans

Andropogon neo-mexicanus

Nash, Torrey Bot. Club Bul. 25:83. 1898.

Schizachyrium neo-mexicanum

Nash, N. Amer. Fl. 17:107. 1912.

Sorghastrum Nash.

Spikelets in pairs, one sessile and perfect, the other pediceled and reduced or often entirely absent, only the hairy pedicel remaining; glumes firm, shiny brown, awnless, the first with long hairs, the second glabrous; fertile lemma hyaline, bearing a twisted, once-geniculate awn; tall perennials with auricled sheath and flat blades; panicles loosely contracted. The name is a combination of Sorghum and the Latin suffix astrum meaning a poor imitation of, referring to the vague resemblance of Sorghastrum to Sorghum.

Sorghastrum nutans (L.) Nash in Small, Fl. Southeast. U. S. 66. 1903. INDIAN GRASS, WOOD GRASS.

S. nutans was collected from a roadside ditch along U. S. Highway 85 at the Sandoval-Bernalillo County Line and also was collected five miles south of U. S. Highway 66 at the edge of State Highway 45. It is a cosmopolitan

grass covering the entire United States with the exception of the Northwest Pacific States. It was at one time an important wild hay crop in the Great Plains region. It has retreated to waste places and is now usually found in roadside and railroad ditches.

Selected synonyms: Andropogon nutans L., Sp. Pl. 1045. 1753.

Sorghum nutans A. Gray, Man. 617. 1848.

Chrysopogon avenaceus Benth., Linn. Soc. Jour. Bot. 19:73. 1881.

Sorghastrum avenaceum Nash in Britton, Man. 71. 1901.

Holcus nutans Kuntze ex Stuck., An. Mus. Nac. Buenos Aires 11:48. 1904.

Sorghum Moench.

Spikelets in pairs, one sessile and perfect, awned, the other pediceled and sterile or usually staminate, awnless; the terminal, sessile spikelet having two pediceled spikelets with it; glumes shiny, indurate, usually sparsely pubescent; fertile lemma hyaline, as long as the glumes, bearing a loosely twisted, once-geniculate awn which is early deciduous; panicle open;

grass covering the entire Mesa Grande with the exception of the northwest part is Mesa. It was at one time an important wild hay producing Kern County grazing region. It has reverted to waste pasture or is now usually found in roadside and railroad fences.

Selected synonyms: Agrostis pallens Trin.

Pl. 1045. 1733.

Agrostis aculeata L. Sp. 88.

617. 1848.

Polypogon avenaceus Lamk.

Illus. Gen. Bot. 1417. 1792.

Agrostis avenaceus Nees

in Britton, Man. 72. 1901.

Polypogon fimbriatus Pursh ex Steud.

Am. Nat. Nat. Encyc. 1:1. 1804.

Sporobolus Loscob.

Spikelets in pairs, one sessile and perfect, awned, the other pedicelled and staminate or usually abortive, awnless; the terminal, sessile spikelet having two pedicelled spikelets with their glumes adhering, fugacious, usually sparsely pubescent for the lower lemma hyaline. As long as the glumes, barren, usually twisted, oblongo-cuneiformate awn which is often longer than the spikelet.

tall annuals or perennials. The name comes from Sorgho, which is the Italian name of this group of plants.

Sorghum halepense (L.) Pers., Syn. Pl. 1:101. 1805.

JOHNSON GRASS.

S. halepense is a common weed along roadside ditches near the Rio Grande. It is difficult to eradicate because of its creeping rhizomes. Johnson grass may produce certain compounds, which in sufficient abundance causes prussic-acid poisoning to grazing animals. It has been collected from roadside ditches near the intersection of Matthew Boulevard and Rio Grande Boulevard.

Selected synonyms: Holcus halepensis L., Sp. Pl. 1047. 1753.

Andropogon halepensis Brot., Fl. Lusit. 1:89. 1804.

Key to the genera of Aveneae

Lemmas awned from the back, below the apex; rachilla prolonged as a hairy bristle----------Trisetum

Lemmas awnless; rachilla prolonged as a smooth or slightly scabrous bristle

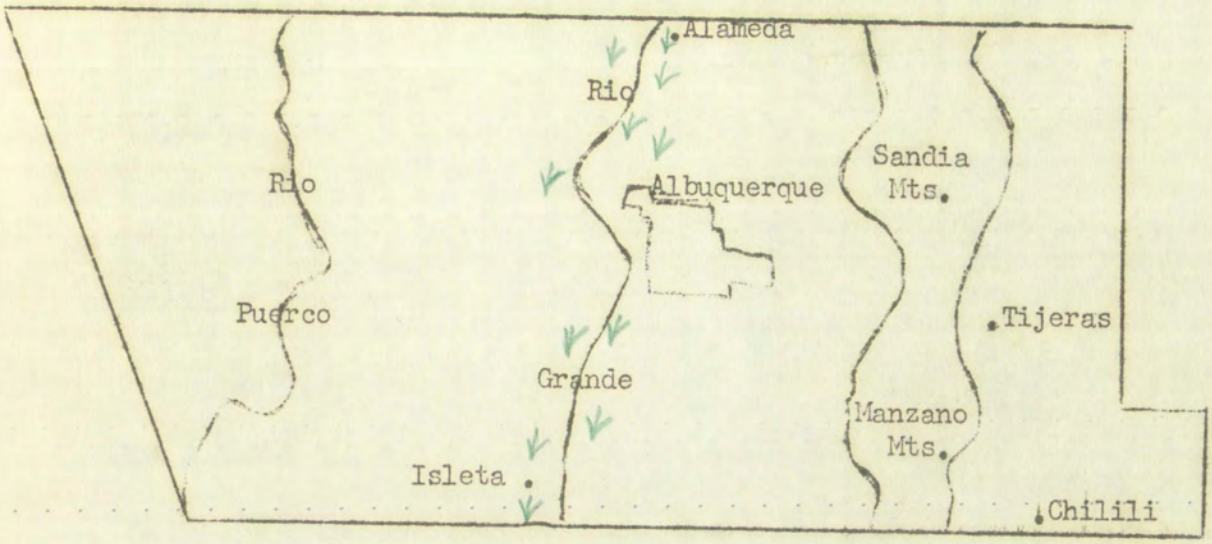

Fig. 39 Distribution of Sorghum halepense

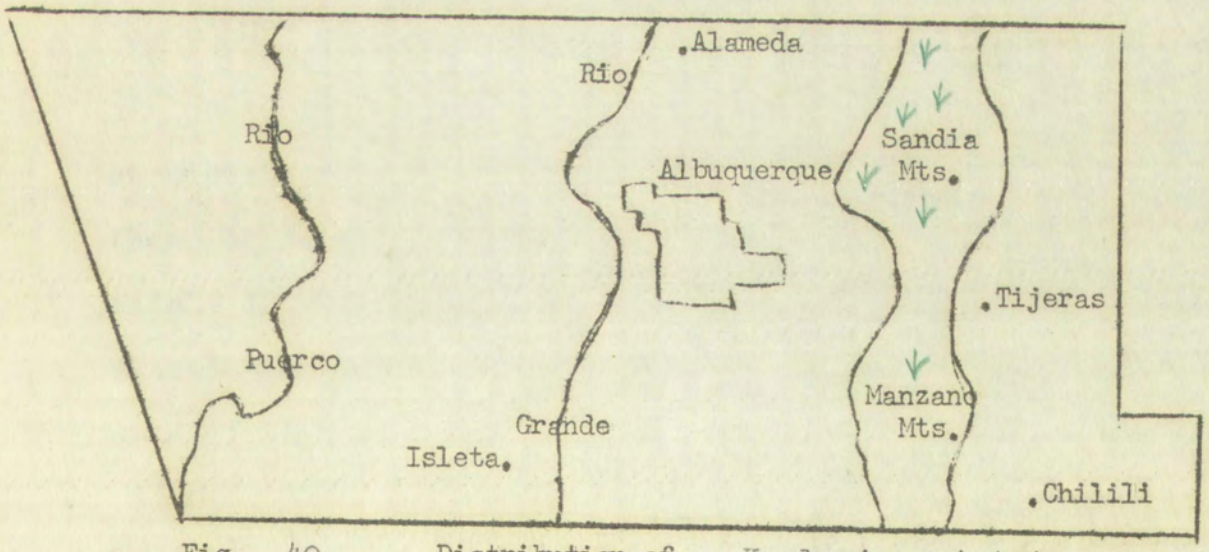

Fig. 40 Distribution of Koeleria cristata

Blades flat, more than 3 mm. wide; spikelets less than 3.5 mm. long----------Sphenopholis

Blades often involute, less than 3 mm. wide; spikelets more than 3.5 mm. long----------Koeleria

Koeleria Pers. JUNEGRASS.

Spikelets 2 to 4-flowered, disarticulating above the glumes and between the florets; rachilla prolonged beyond upper floret as a slender bristle; glumes obviously different; second glume longer and broader than first glume; lemmas acute, awnless, green with scarious margins; paleas entirely hyaline, slightly shorter than the lemmas; annual or perennial with spikelike panicles. It was named for G. L. Koeler, an early agrostologist.

Koeleria cristata (L.) Pers., Syn. Pl. 1:97. 1805.

MOUNTAIN JUNEGRASS, PRAIRIE JUNEGRASS.

K. cristata is abundant in the Sandia Mountains at elevation above 8,000 feet. Collections were made there in an open meadow near Kiwanis Point at approximately 10,000 feet. Mountain Junegrass is found in association with Agrostis scabra and Trisetum spicatum, usually in open meadows or forest openings.

Selected synonyms: Aira cristata L., Sp. Pl. 63. 1753.

Poa cristata L., Sept. Nat. ed. 12. 94. 1767.

Koeleria gracilis Pers., Syn. Pl. 1:97. 1805.

Koeleria nitida Nutt., Gen. Pl. 1:74. 1818.

Sphenopholis Scribn. WEDGEGRASS, WEDGESCALE.

Spikelets 2 to 3-flowered, disarticulating below the glumes; rachilla extended beyond upper floret as a slender bristle; glumes obviously different in shape; the first glume narrow, acute, 1-nerved; the second broadly obovate and 3-nerved; lemmas firm, awnless; palea hyaline; perennials with flat blades and narrow panicles. The generic name comes from the Greek sphen meaning wedge and pholis meaning horny scale, referring to the firm, broad second glume.

Sphenopholis obtusata (Michx.) Scribn., Rhodora 8:144. 1906. PRAIRIE WEDGESCALE, PRAIRIE WEDGEGRASS.

S. obtusata is found at the edge of many irrigation

Selected synonyms: *Aira aristata* L., Sp. Pl. 65. 1753.

Poa aristata L., Sept. Sec. ed. 12. 94. 1767.

Lopelia aristata Fers., Syn. Pl. 1:97. 1805.

Lopelia mutica Nutt., Gen. Pl. 1:74. 1818.

Sphenophoia Scribn. SPHENOPHOIA, WEDGEGRASS.

Spikelets 2 to 3-flowered, disarticulating below the glumes; rachilla extended beyond upper floret as a slender bristle; glumes obviously different in shape: the first glume narrow, acute, 1-nerved; the second broadly obovate and 3-nerved; lemmas firm, awnless; palea hyaline; perennials with flat blades and narrow panicles. The generic name comes from the Greek σφήν meaning wedge and *phoia* meaning bony scale, referring to the firm, broad second glume.

Sphenophoia obtusata (Mikan.) Scribn., Rhodora 8:144. 1906. PRAIRIE WEDGEGRASS, PRAIRIE WEDGEGRASS.

S. *obtusata* is found at the edge of many irrigation

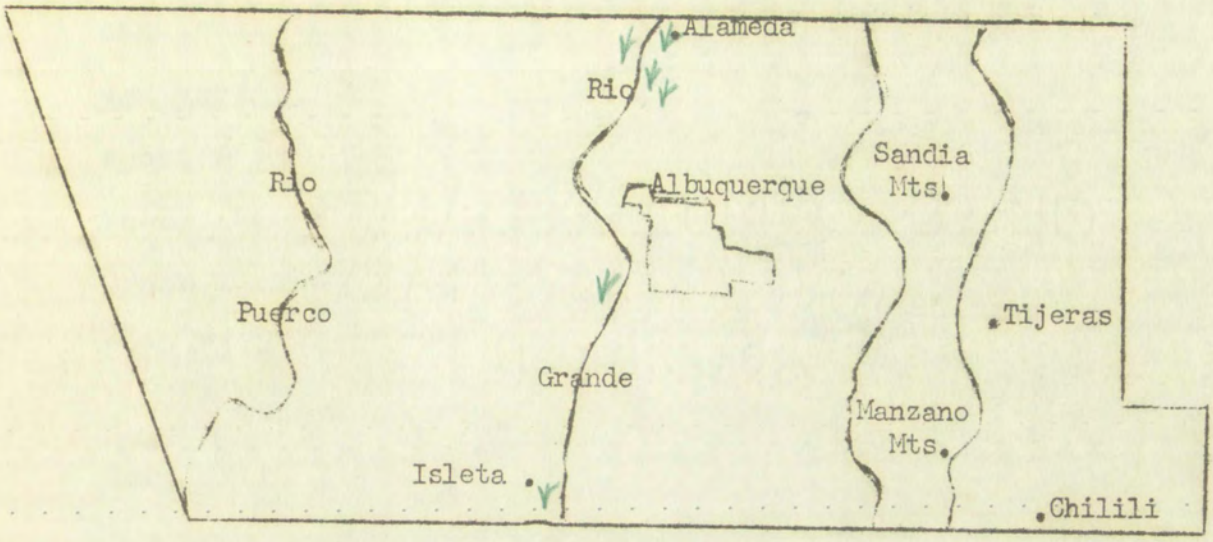

Fig. 41 Distribution of Sphenopholis obtusata

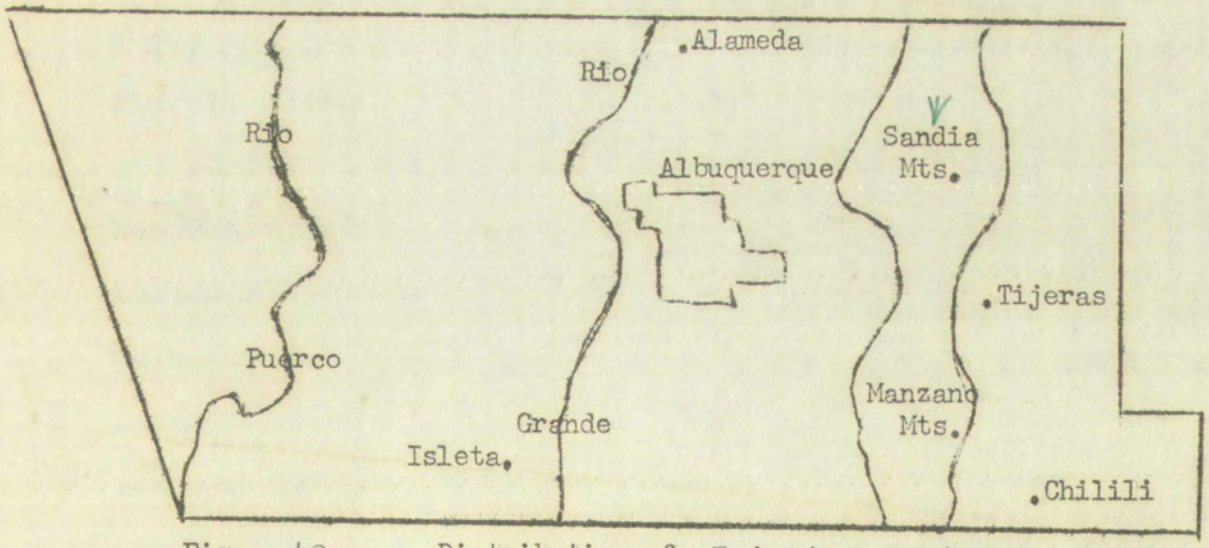

Fig. 42 Distribution of Trisetum montanum

canals in the county in association with Agrostis semiverticillata and Polypogon monspeliensis. This species was collected at the western end of the Sandia Pueblo Grant along the edge of the Albuquerque Riverside Drain three-fourths of a mile south of the Sandoval-Bernalillo County Line.

Selected synonyms: Aira obtusata Michx., Fl. Bor. Amer. 1:62. 1893.

Trisetum lobatum Trin., Acad. St. Petersb. Mem. VI. Math. Phys. Nat. 1:66. 1830.

Eatonia obtusata A. Gray, Man. ed. 2. 558. 1856.

Trisetum Pers. TRISETUM.

Spikelets 2 to 5-flowered, usually disarticulating above the glumes; rachilla prolonged behind the upper floret, often hairy; glumes unequal, first glume narrower and shorter than second glume; lemmas toothed at apex bearing a twisted, geniculate awn from below the apex; tufted perennials or annual with flat blades and usually narrow panicles. This genus name comes from Latin tri meaning three and setum meaning bristle, alluding to the awn and two teeth of the apex of the lemma.

Key to the species of Trisetum

Panicle dense, spikelike; culms in dense tufts less than 50 cm. tall----------T. spicatum

Panicle loosely contracted, not spikelike; culms in scattered tufts or solitary, often more than 50 cm. tall----------T. montanum

Trisetum montanum Vasey, Torrey Bot. Club Bul. 13:118. 1886. ROCKY MOUNTAIN TRISETUM.

T. montanum Vasey was collected in 1932 in the woods near Sandia Crest at approximately 10,500 feet. The specimen was identified by C. L. Porter as T. canescens Buckl. and placed in the herbarium of the University of New Mexico. Spikelets measuring 5 to 6 mm. long and awns measuring less than 8 mm. long make it necessary to call this plant T. montanum Vasey rather than T. canescens Buckl. It inhabits mountain meadows, grassy forest openings, and moist places on mountain slopes, usually above 8,000 feet elevation.

Selected synonyms: Graphephorum Shearii Rydb., Torrey Bot. Club Bul. 32:602. 1905.

Trisetum canescens var. montanum Hitchc., Biol. Soc. Wash. Proc. 41:160. 1928.

Key to the species of *Triaetum*

Panicle dense, spikelike; culms in dense tufts less than 50 cm. tall----------*T. gracilens*

Panicle loosely contracted, not spikelike; culms in scattered tufts or solitary, often more than 50 cm. tall----------*T. montanum*

Triaetum montanum Vasey, Torrey Bot. Club Bul. 13:118. 1886. ROCKY MOUNTAIN TRIAETUM.

T. montanum Vasey was collected in 1958 in the woods near Sandia Crest at approximately 10,500 feet. The specimen was identified by O. L. Porter as *T. canescens* Buckl. and placed in the herbarium of the University of New Mexico. Spikelets measuring 5 to 6 mm. long and awns measuring less than 8 mm. long make it necessary to call this plant *T. montanum* Vasey rather than *T. canescens* Buckl. It inhabits mountain meadows, grassy forest openings, and moist places on mountain slopes, usually above 8,000 feet elevation.

Selected synonyms: *Graphephorum shearii* Rydb., Torrey Bot. Club Bul. 32:602. 1905.

Triaetum canescens var. *montanum* Hitchc., Biol. Soc. Wash. Proc. 41:160. 1928.

Trisetum montanum var. *pilosum* Louis-Marie, Rhodora 30:212. 1928.

Trisetum spicatum (L.) Richt., Pl. Eur. 1:59. 1890.

SPIKE TRISETUM.

T. spicatum is common in open meadows and boulder fields in the Sandia Mountains at elevations above 9,000 feet. It is found in association with *Agrostis scabra* and *Koeleria cristata*.

Selected synonyms: *Aira spicata* L., Sp. Pl. 64. 1753.

Trisetum subspicatum Beauv., Ess. Agrost. 88. 149. 1812.

Trisetum Congdoni Scribn. and Merr., Torrey Bot. Club Bul. 29:470. 1902.

Key to the genera of the *Chlorideae*

Flowers imperfect, plants monoecious or dioecious *Buchloe*

Flowers perfect

Spikes paired, digitate, or clustered at or near the apex of the culm

Spikelets with only one perfect floret

Trisetum montanum var. *pilosum*

Louis-Marie, Rhodora 30:212. 1928.

Trisetum spicatum (L.) Richt., Pl. Eur. 1:59. 1890.

SPIKE TRISETUM.

T. spicatum is common in open meadows and moister fields in the Sandia Mountains at elevations above 9,000 feet. It is found in association with *Agrostis scabra* and *Koeleria cristata*.

Selected synonyms: *Aira spicata* L., Sp. Pl. 64. 1753.

Trisetum subspicatum Beauv., Ess. Agrost. 88. 146. 1812.

Trisetum Cordaei Scribn. and Merr., Torrey Bot. Club Bul. 29:470. 1902.

Key to the genera of the Chloridoeae

Flowers imperfect, plants monoecious or dioecious *Buchloe*

Flowers perfect

Spikes paired, digitate, or clustered at or near the apex of the culm

Spikelets with only one perfect floret

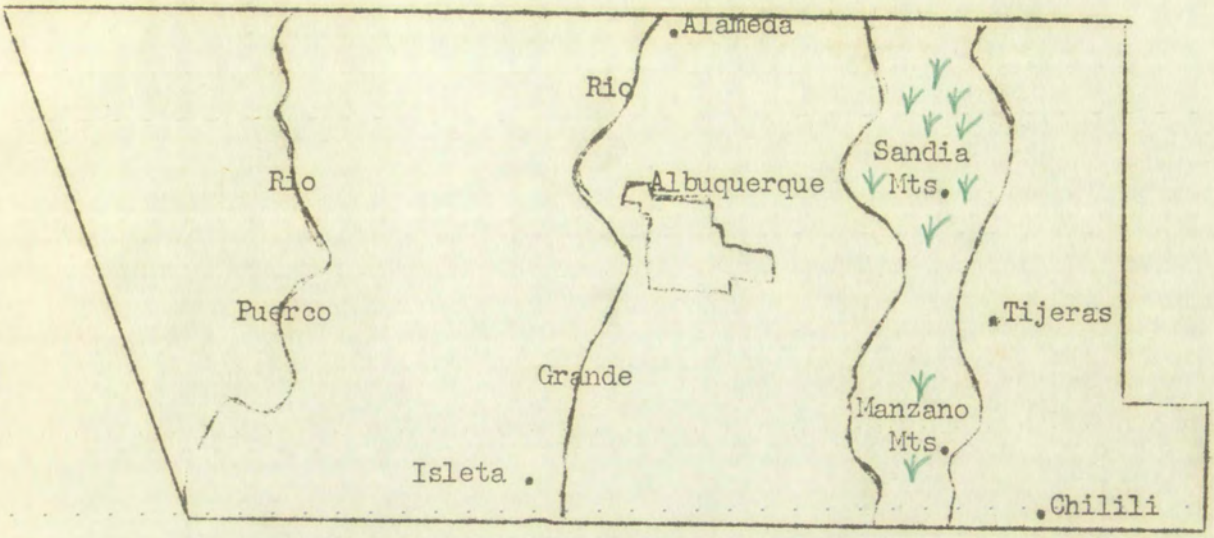

Fig. 43 Distribution of Trisetum spicatum

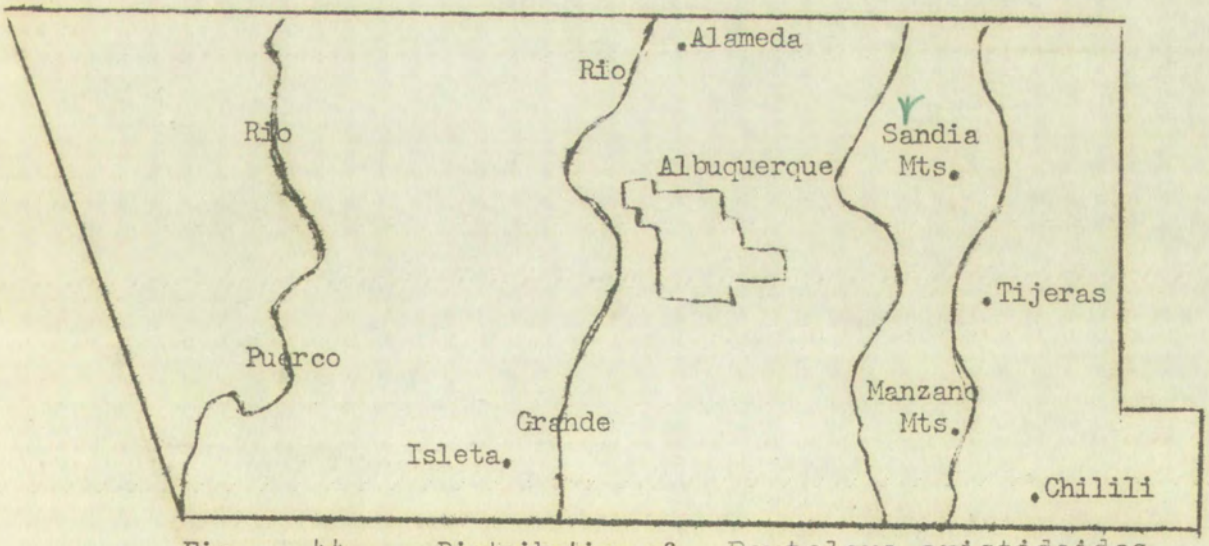

Fig. 44 Distribution of Bouteloua aristidoides

Lemmas awned; spikelets with additional modified florets----------Chloris

Lemmas awnless; spikelets without additional modified florets----------Cynodon

Spikelets with 3 to 6 perfect florets----Eleusine

Spikes arranged laterally along main culm axis

Spikelets with only one perfect floret

Spikelets with 1 to several reduced florets above the perfect floret----------Bouteloua

Spikelets without reduced florets--------Schedonnardus

Spikelets with 2 to several perfect florets Leptochloa

Bouteloua Lag., GRAMA GRASS.

Spikelets sessile in two rows on one side of the rachis with one perfect floret and 1 to 3 reduced or rudimentary florets above; glumes 1-nerved, unequal, the first shorter and narrower than the second; lemma of perfect floret as long or longer than the second glume, 3-nerved, the nerves extending beyond the pointed internerves as mucros or short awns; palea occasionally 2-awned; the rudimentary florets usually consisting of only a 3-awned lemma; perennial or annual with 2 to several spikes sessile on a common axis. This genus was named for Claudio and Cataban Boutelou, professors of agriculture at

the University of Madrid, Spain, during the early 19th century.

Key to species of Bouteloua

Spikes falling entire at maturity
  Plants annual, usually bearing less than 20 spikes per culm----------B. aristidoides
  Plants perennial, usually bearing more than 20 spikes per culm----------B. curtipendula
Axis of spike persistent, spikelets falling separately at maturity
  Plants annual
    Culm bearing single, terminal spike------B. simplex
    Culm bearing one terminal and several lateral spikes B. barbata
  Plants perennial
    Rachis extends beyond base of upper spikelet as a slender point----------B. hirsuta
    Rachis does not extend beyond base of upper spikelet
      Spikes loosely pectinate; culms wooly-pubescent below----------B. eriopoda
      Spikes firmly pectinate; culms glabrous or with scattered, long hairs below---------B. gracilis

the University of Madrid, Spain, during the early 19th century.

Key to species of Poyteldum

Spikes falling entire at maturity

Plants annual, usually bearing less than 20 spikes per culm----------E. aristidoides

Plants perennial, usually bearing more than 20 spikes per culm----------B. quadrangulis

Axis of spike persistent, spikelets falling separately at maturity

Plants annual

Culm bearing single, terminal spike------E. simplex

Culm bearing one terminal and several lateral spikes E. barbata

Plants perennial

Rachis extends beyond base of upper spikelet as a slender point----------B. hirsuta

Rachis does not extend beyond base of upper spikelet

Spikes loosely pectinate; culms woolly-pubescent below----------B. erioceda

Spikes firmly pectinate; culms glabrous or with scattered, long hairs below---------B. erectifis

Bouteloua aristidoides (H. B. K.) Griseb., Brit. W. Ind. 537. 1864. NEEDLE GRAMA, SIX-WEEKS GRAMA.

B. aristidoides was collected in the Sandia Mountains by Nielson and Abbout in July, 1937. This species was not seen by the author in Bernalillo County during the 1950-52 collecting period. It is a six-weeks annual but lacks the forage value of B. barbata, another six-weeks grama. Needle grama derives its name from the sharp-pointed spikes of the inflorescence. These spikes may work their way into clothing thus causing this species to be considered a nuisance in populated areas. It is usually found in arroyos and open, rocky foothills.

Selected synonyms: Dinebra aristidoides H. B. K., Nov. Gen. et Sp. 1:171. 1816.

Atheropogon aristidoides Roem. and Schult., Syst. Veg. 2:415. 1817.

Triathera aristidoides Nash in Small, Fl. Southeast. U. S. 137. 1903.

Bouteloua barbata Lag., Var. Cienc. 4:141. 1805. SIX-WEEKS GRAMA.

B. barbata is one of the most valuable of the six-weeks grasses on the southwestern ranges. It is an annual which

Bouteloua aristidoides (H. B. K.) Griseb., Pritz. W. Ind. 537. 1864. NEEDLE GRAMA, SIX-WEEKS GRAMA.

B. aristidoides was collected in the Sandia Mountains by Nielson and Abbott in July, 1937. This species was not seen by the author in Bernalillo County during the 1950-52 collecting period. It is a six-weeks annual but lacks the forage value of B. barbata, another six-weeks grama. Needle grama derives its name from the sharp-pointed spikes of the inflorescence. These spikes may work their way into clothing thus causing this species to be considered a nuisance in populated areas. It is usually found in arroyos and open, rocky foothills.

Selected synonyms: Dinebra aristidoides H. B. K., Nov. Gen. et Sp. 1:171. 1816.

Atheropogon aristidoides Roem. and Schult., Syst. Veg. 2:415. 1817.

Triaenera aristidoides Nash in Small, Fl. Southeast. U. S. 137. 1903.

Bouteloua barbata Lag., Var. Ciene. 4:141. 1805. SIX-WEEKS GRAMA.

B. barbata is one of the most valuable of the six-weeks grasses on the southwestern ranges. It is an annual which

appears rapidly following the first summer rains, causing the desert mesas to appear green. It is very palatable and disappears quickly in grazed areas. A specimen was collected on the East Mesa seven and one-half miles east of U. S. Highway 85 and three miles north of U. S. Highway 66 during the month of August. It commonly inhabits sandy mesas, arroyos, and rocky hills.

Selected synonyms: Chondrosium polystachyum Benth., Bot. Voy. Sulph. 56. 1844.

Bouteloua polystachya Torr., U. S. Expl. Miss. Pacif. Rpt. 5:366. pl. 10. 1857.

Bouteloua microstachya L. H. Dewey, U. S. Natl. Herb. Contrib. 2:531. 1894.

Bouteloua micrantha Scribn. and Merr., U. S. Dept. Agr., Div. Agrost. Cir. 32:8. 1901.

Bouteloua curtipendula (Michx.) Torr. in Emory, Notes on Mil. Reconn. 154. 1848. SIDE-OATS GRAMA.

B. curtipendula is an excellent forage grass that withstands grazing very well. It is widely distributed, but seldom forms pure stands, usually growing among other grasses such as Bouteloua gracilis or Sporobolus contractus. B. curtipendula has been collected on dry hillsides along

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Bouteloua polystachya Torr., U. S. Expl. Mies. Pacif. Rpt. 5:366. pl. 10. 1857.

Bouteloua microstachya L. H. Dewey, U. S. Natl. Herb. Contrib. 2:321. 1894.

Bouteloua microstoma Scribn. and Merr., U. S. Dept. Agr., Div. Agrost. Cir. 32:8. 1901.

Bouteloua curtipendula (Mich.) Torr. in Emory, Notes on Mil. Reconn. 154. 1848. SIDE-OATS GRAMA.

B. curtipendula is an excellent forage grass that withstands grazing very well. It is widely distributed, but seldom forms pure stands, usually growing among other grasses such as Bouteloua gracilis or Sporobolus cryptandrus. B. curtipendula has been collected on dry hillsides along

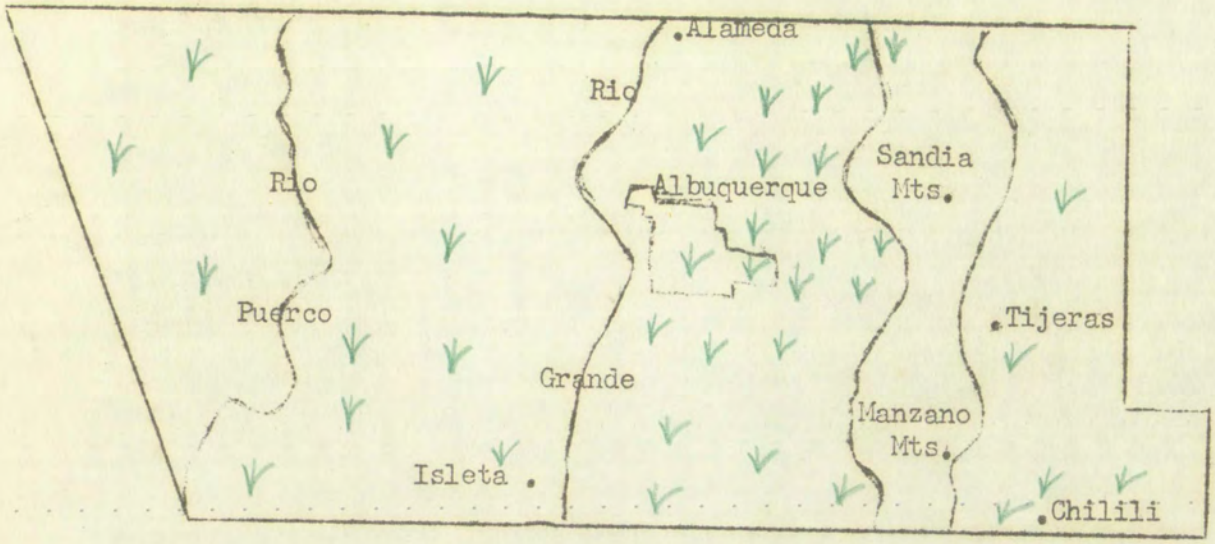

Fig. 45 Distribution of Bouteloua barbata

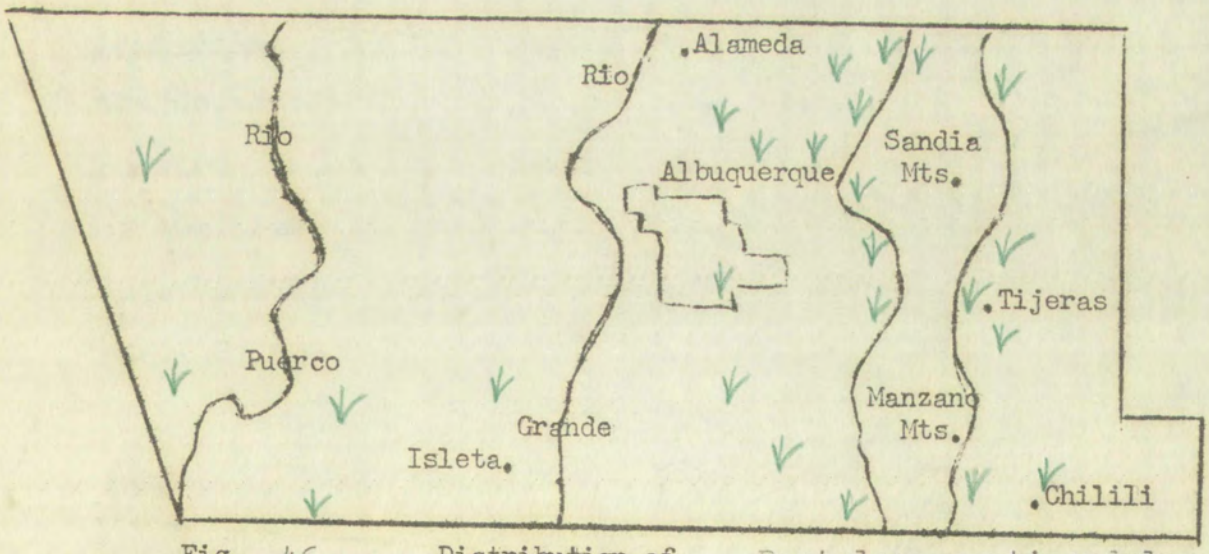

Fig. 46 Distribution of Bouteloua curtipendula

the Sandia Loop Drive at approximately 7,000 feet, and in an arroyo three miles east of Albuquerque. Side-oats grama is a common inhabitant of hills and forest openings.

Selected synonyms: Chloris curtipendula Michx., Fl. Bor. Amer. 1:59. 1803.

Bouteloua racemosa Lag., Var. Cienc. 4:141. 1805.

Atheropogon curtipendulus Fourn., Mex. Pl. 2:138. 1886.

Bouteloua eriopoda (Torr.) Torr., U. S. Expl. Miss. Pacif. Rpt. 4:155. 1856. BLACK GRAMA.

B. eriopoda was collected eight and one-half miles east of U. S. Highway 85 and four miles south of U. S. Highway 66 in Coyote Arroyo in association with Aristida longiseta. It is an extremely valuable forage grass of the desert plains grassland because of its ability to survive extreme drought. The wooly-pubescent internodes of the lower culms are a distinguishing characteristic of this species. Black grama is common on sandy mesas, arroyos, rocky hills, and dry open ground.

Selected synonyms: Chondrosium eriopodum Torr. in Emory, Notes Mil. Reconn. 154. 1848.

Bouteloua brevifolia Buckl., Acad. Nat. Sci. Phila. Proc. 1862:93. 1862.

Bouteloua gracilis (H. B. K.) Lag. ex Steud., Nom Bot. ed. 2. 1:219. 1840. BLUE GRAMA.

B. gracilis was collected on rocky hillsides at the edge of the Sandia Loop Drive just below Tejano Camp Ground at approximately 7,500 feet. Blue grama is one of the most valuable forage grasses of the southwestern range country. Unfortunately the once lush acres of knee-high blue grama have disappeared because of overgrazing and unsuccessful attempts at farming. Large areas of blue grama have been plowed under and abandoned. This land has since become covered with such undesirable plants as Russian thistle (Salsola pestifer) and snakeweed (Gutierrezia sp.). Blue grama commonly occupies rocky slopes, meadows, forest openings, and open plains.

Selected synonyms: Chondrosium gracile H. B. K., Nov. Gen. et Sp. 1:176. pl. 58. 1816.

Atheropogon oligostachyus Nutt., Gen. Pl. 1:78. 1818.

Bouteloua oligostachya Torr. ex A. Gray, Man. ed. 2. 553. 1856.

Bouteloua gracilis (HBK.) Lag.

Acad. Nat. Sci. Phila. Proc. 1862:95. 1862.

Bouteloua oligostachya (H. B. K.) Lag. ex Steud., Nom. Bot.

ed. 2. 1:219. 1840. [illegible]

B. oligostachya was collected on rocky hillsides at the edge of the Sandia Loop Drive just below Tejano Camp Ground at approximately 7,500 feet. This grass is one of the most valuable forage grasses of the southwestern range country. Unfortunately the open land across at three-mile blue grass have disappeared because of overgrazing and unsuccessful attempts at farming. Large areas of blue grass have been plowed under and abandoned. Some land has since become covered with such undesirable plants as Russian thistle (Salsola pestifer) and sunflower (Helianthus ann.). Blue grass commonly occupies upper slopes, ridge tops, forest openings, and open glades.

Selected synonyms: Chondrosum gracile (H. B. K.) Hov. Gen. et Sp. 1:176. pl. 76. 1816.

Chondrosum oligostachyum Nutt.

Gen. Pl. 1:72. 1818.

Bouteloua polystachya Torr.

ex A. Gray, Nom. ed. 2. 527. 1848.

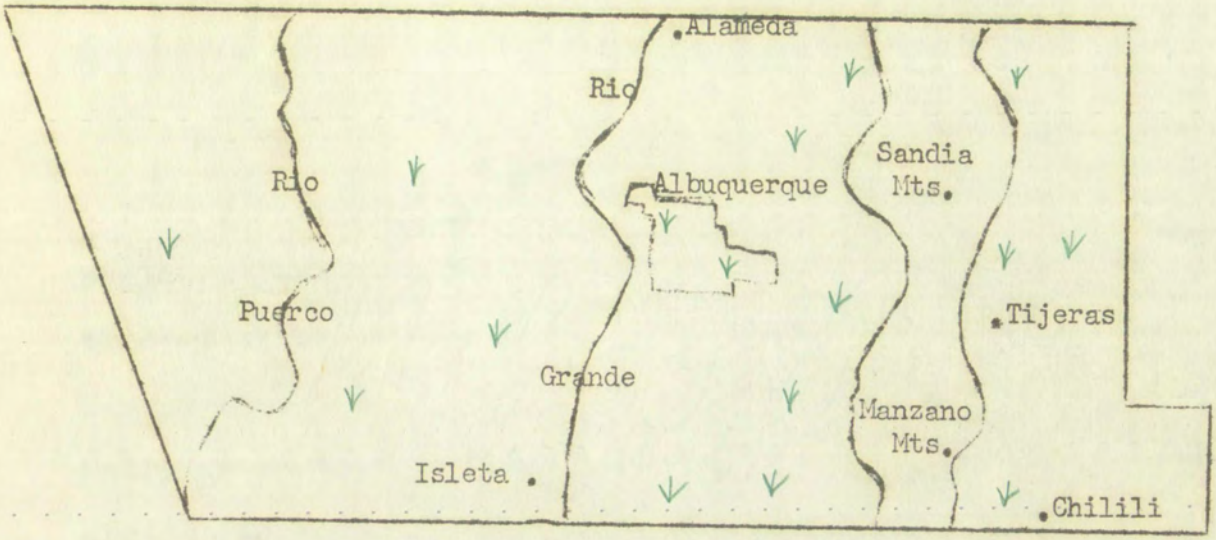

Fig. 47 Distribution of Bouteloua eriopoda

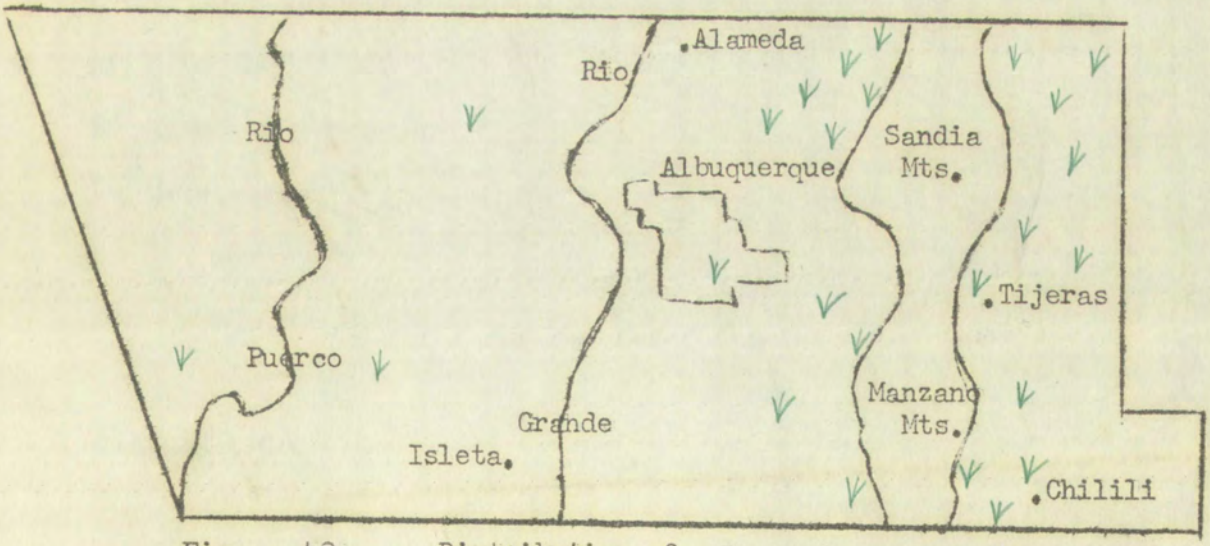

Fig. 48 Distribution of Bouteloua gracilis

Bouteloua hirsuta Lag., Var. Cienc. 4:141. 1805. HAIRY GRAMA.

B. hirsuta was collected in sandy soil among large boulders just south of La Cueva Camp Ground, which lies three-fourths of a mile south of the Sandoval-Bernalillo County Line and about six miles east of U. S. Highway 85. Hairy grama is readily distinguished from most other grama grasses by the rachis tip that extends beyond the base of the terminal spikelet of each spike. B. glandulosa is the only other grama grass with this distinctive character, and it differs from B. hirsuta by having densely pubescent culms and reflexed spikes. The hairy appearance of the spike of B. hirsuta is due to the stiff hairs on the glumes and the awns of the rudimentary florets. Hairy grama is usually found in association with blue grama. It lacks the value of blue grama as a forage grass because it is seldom found in great abundance and does not commonly form pure stands. It usually inhabits rocky hills and sandy mesas.

Selected synonyms: Chondrosium hirtum H. B. K., Nov. Gen. et Sp. 1:176. pl. 59. 1816.

Bouteloua hirta Scribn., U. S. Natl. Herb. Contrib. 2:531. 1894.

Bouteloua pectinata Featherly, Bot. Gaz. 91:103. f. 1-4. 1931.

Bouteloua simplex Lag., Var. Cienc. 4:141. 1805. MAT GRAMA.

B. simplex is easily recognized by its low, annual habit and its solitary, terminal spikes. A specimen was collected from the University of New Mexico golf course. This species is not abundant in Bernalillo County. It usually inhabits dry plains, rocky slopes, and open ground.

Selected synonyms: Bouteloua prostrata Lag., Gen. et Sp. Nov. 5. 1816.

Bouteloua pusilla Vasey, Torrey Bot. Club Bul. 11:6. 1884.

Bouteloua procumbens Griffiths, U. S. Natl. Herb. Contrib. 14:364. 1912.

Buchloe Engelm.

Plants dioecious or occasionally monoecious; staminate spikelets 2-flowered, sessile, and pectinate, in two rows on one side of a slender rachis, forming a single one-sided spike, or 2 to 4 spikelike branches; pistillate spikelets 4 to 5 in a head, the heads sessile, usually in pairs, and partly hidden among the leaves; low, stoloniferous perennial with flat, curly blades. The name is derived from the Greek Boubalos, meaning buffalo, and chloe meaning grass, referring to the common name "buffalo grass".

Bouteloua simplex Lag., Var. Glens. 4:147. 1805. NAT GRASS.

B. simplex is easily recognized by the low, annual habit and its solitary, terminal spikes. A specimen was collected from the University of New Mexico golf course. This species is not abundant in Bernalillo County. It usually inhabits dry plains, rocky slopes, and open ground.

Selected synonyms: Bouteloua perpusilla Lag., Gen. et Sp. Nov. 3. 1816.

Bouteloua gracilis Vasey, Torrey Bot. Club Bul. 11:6. 1884.

Bouteloua trichopoda Griffiths, U. S. Natl. Herb. Contrib. 14:364. 1912.

Buchloe Engelm.

Plants dioecious or occasionally monoecious; staminate spikelets 2-flowered, sessile, and pectinate, in two rows on one side of a slender rachis, forming a single one-sided spike, or 2 to 4 spikelike branches; pistillate spikelets 4 to 5 in a head, the heads sessile, usually in pairs, and partly hidden among the leaves; low, stoloniferous perennial with flat, curly blades. The name is derived from the Greek Boubalos, meaning buffalo, and chloe meaning grass, referring to the common name "buffalo grass".

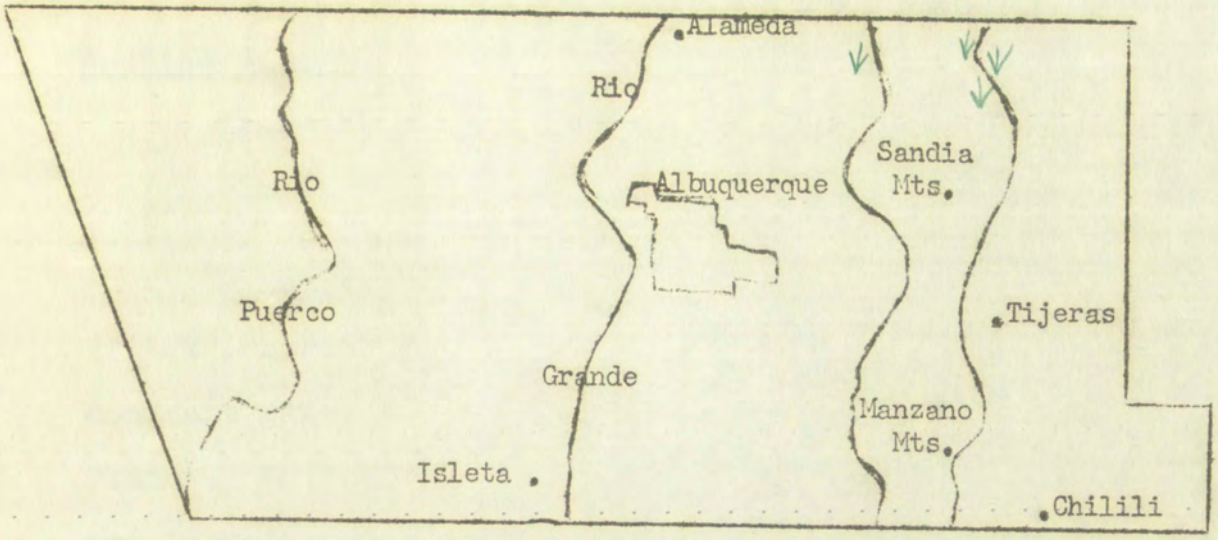

Fig. 49 Distribution of Bouteloua hirsuta

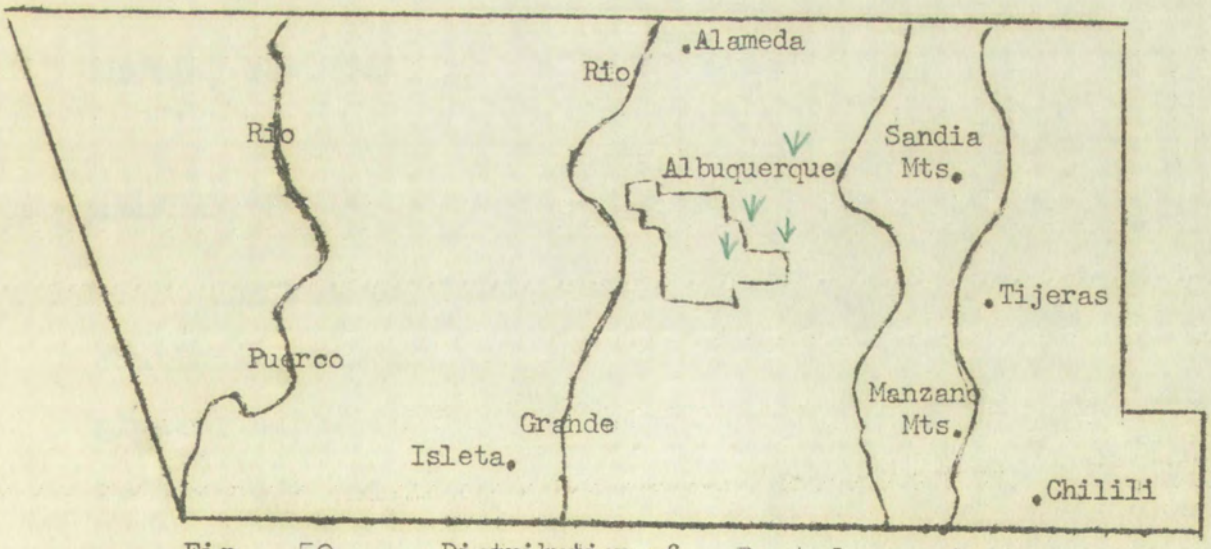

Fig. 50 Distribution of Bouteloua simplex

Buchloe dactyloides (Nutt.) Engelm., Acad. Sci. St. Louis, Trans. 1:432. pl. 12, 14, f. 1-17. 1859. BUFFALO GRASS.

B. dactyloides was collected from a shaded lawn at 22 Los Arboles Road, Albuquerque. This species was the dominant grass of the "short-grass country" of the Great Plains. Buffalo grass is found in eastern New Mexico and has been introduced into Bernalillo County. If heavily grazed, it seems to disappear during drought, but recovers rapidly when the rains come. It forms a very dense sod and once established is an excellent soil binder and forage grass. It inhabits dry, open plains.

Selected synonyms: Sesleria dactyloides Nutt., Gen. Pl. 1:65. 1818.

Bulbilis dactyloides Raf. ex Kuntze, Rev. Gen. Pl. 2:763. 1891.

Chloris Swartz. FINGERGRASS.

Spikelets sessile in two rows on one side of a continuous rachis, the rachilla disarticulating above the glumes; spikelets with one perfect floret and 1 to several reduced florets above; glumes narrow, acute, unequal, the

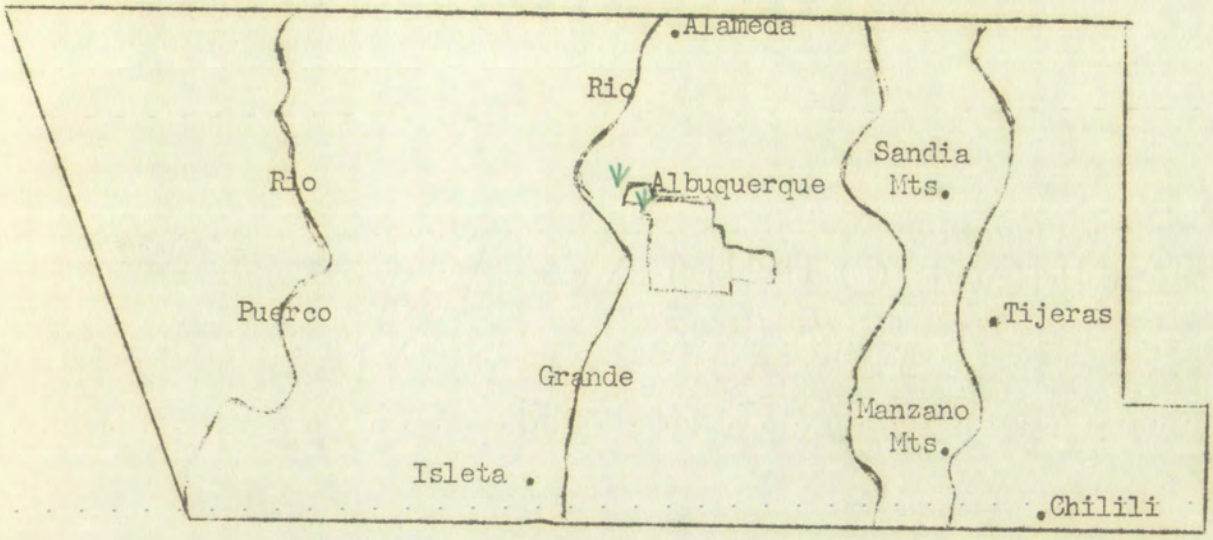

Fig. 51 Distribution of Buchloe dactyloides

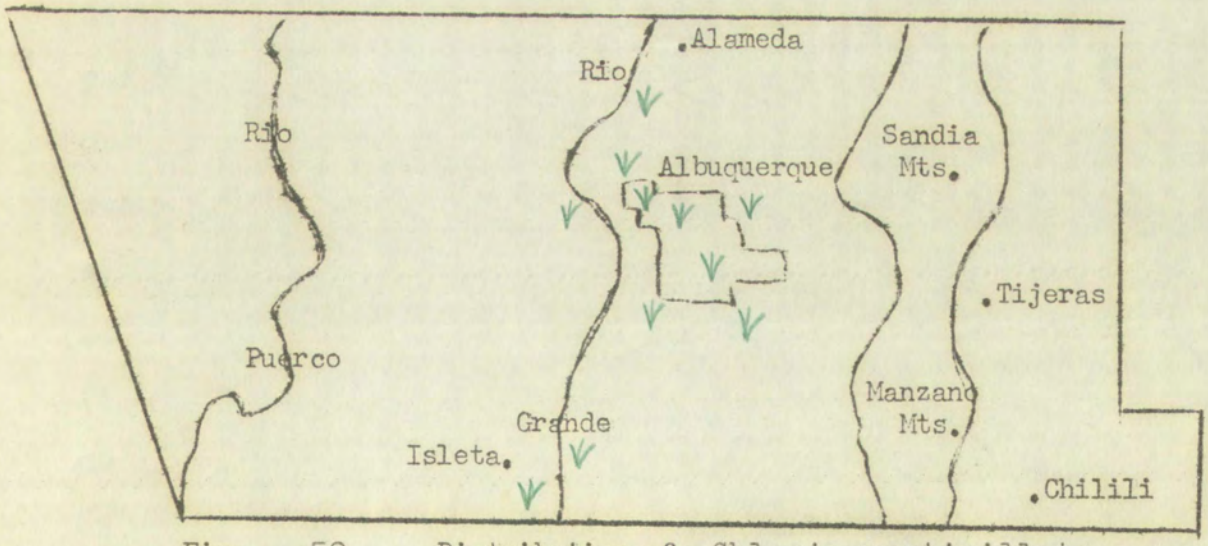

Fig. 52 Distribution of Chloris verticillata

first shorter; lemma broad, compressed, often hairy on callus and along nerves, awned from between teeth of a bifid apex; annuals or perennials with two to many spikes clustered at tip of the culms. The genus is named in honor of Chloris, the Greek goddess of flowers.

Key to the species of Chloris

Plants annual; lemmas bearing long tuft of hairs near dorsal apex----------C. virgata

Plants perennial; lemmas appressed-pubescent near dorsal apex----------C. verticillata

Chloris verticillata Nutt., Amer. Phil. Soc. Trans. (n. s.) 5:150. 1837. WINDMILL GRASS.

C. verticillata derives its name from the whorled or verticillate arrangement of the spikes on the central culm axis. A specimen was collected in moist, sandy soil on the University of New Mexico golf course. This species was reported as being common on low, sandy land around Albuquerque in a report of an investigation on grasses of the Southwest by the Department of Agriculture in 1887 (Vasey, 1887.). Windmill grass has now retreated to the cultivated or irrigated areas of the city. Its inflorescence often breaks off at maturity forming a tumbleweed.

Chloris virgata Swartz, Fl. Ind. Occ. 1. 203. 1797.

FEATHER FINGERGRASS.

C. virgata was collected from the University of New Mexico golf course. It is a common weed in cultivated areas in Albuquerque. The green-purple inflorescence has a feathery appearance because of the tufts of hairs clustered near the apex of each lemma. C. virgata is a good soil binder but has little forage value. It usually inhabits roadside ditches, desert arroyos, and moist waste places.

Selected synonyms: Chloris pubescens Lag., Var. Cien. 4:143. 1805.

Chloris elegans H. B. K., Nov. Gen. et Sp. 1:166. pl. 49. 1816.

Chloris alba var. aristulata Torr., U. S. Expl. Miss. Pacif. Rpt. 4:155. 1857.

Cynodon L. Rich.

Spikelets 1-flowered, sessile in two rows on same side of rachis forming slender spikes which are digitate at tips of culms; rachilla disarticulating above the glumes and extending beyond base of palea as a smooth bristle, occasionally bearing a rudimentary lemma; glumes narrow, 1-nerved, shorter than lemma; lemma pubescent on

Chlorís virgata Swartz, Fl. Ind. Occ. I, 203. 1797.

FEATHER PINCHGRASS.

C. virgata was collected from the University of New Mexico golf course. It is a common weed in cultivated areas in Albuquerque. The green-purple inflorescence has a feathery appearance because of the turfs of hairs clustered near the apex of each lemma. C. virgata is a good soil binder but has little forage value. It usually inhabits roadside ditches, desert arroyos, and moist waste places.

Selected synonyms: Chloris pubescens Lag., Var. Olem. 4:143. 1805.

Chloris elongata H. B. K., Nov. Gen. et Sp. 1:166. pl. 49. 1816.

Chloris alba var. articulata Torr., U. S. Expl. Miss. Pacif. Rpt. 4:155. 1857.

Dynodon L. Rich.

Spikelets 1-flowered, sessile in two rows on one side of rachis forming slender spikes which are digitate at tips of culms; rachilla disarticulating above the glumes and extending beyond base of palea as a smooth bristle, occasionally bearing a rudimentary lemma; glumes narrow, 1-nerved, shorter than lemma; lemma puberulent on

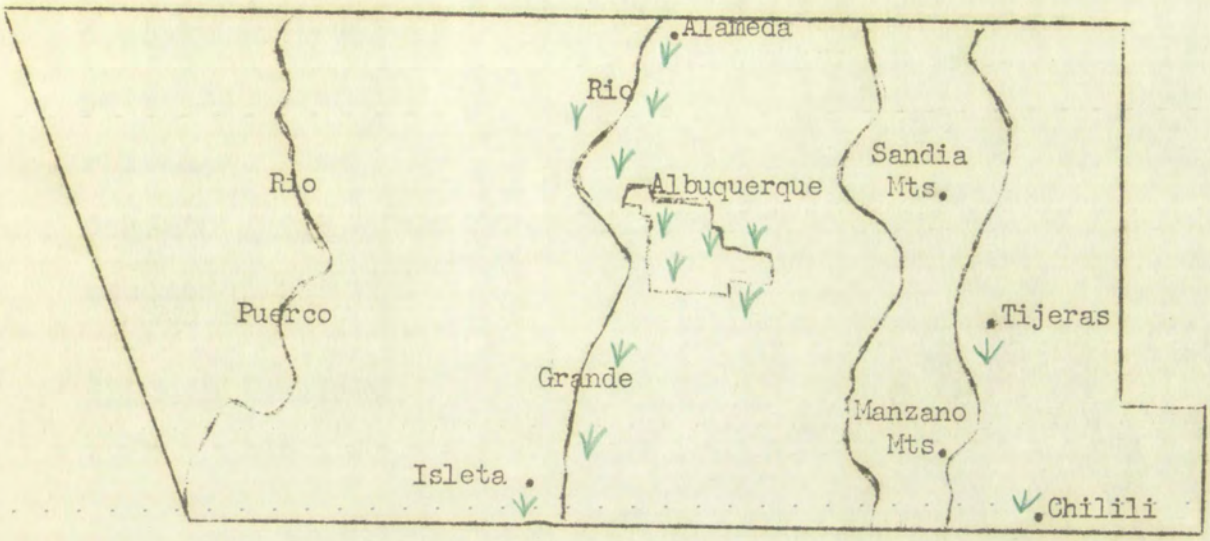

Fig. 53 Distribution of Chloris virgata

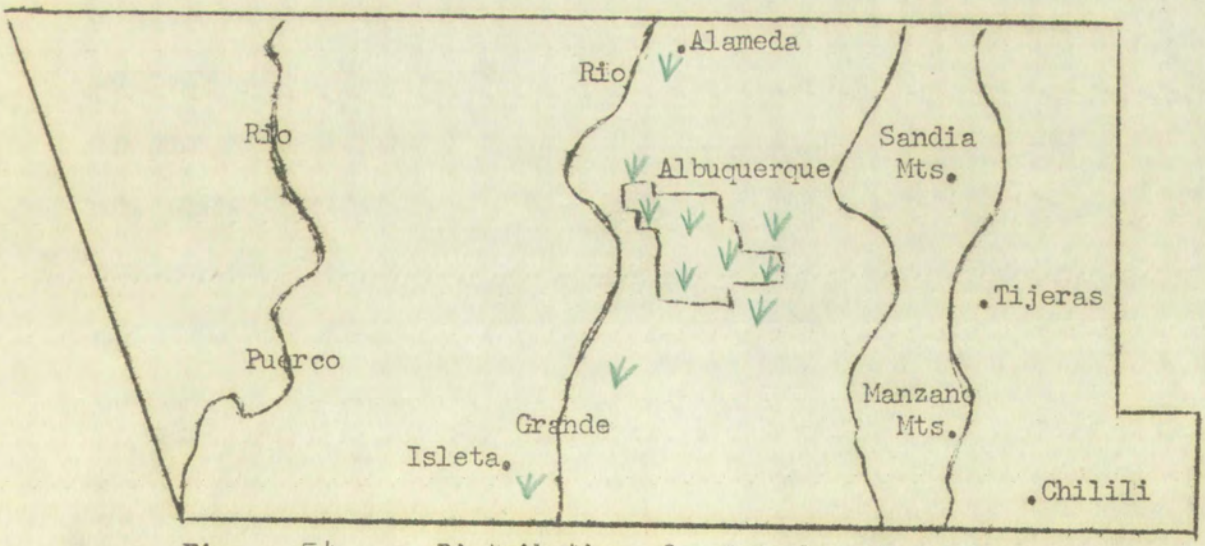

Fig. 54 Distribution of Cynodon dactylon

dorsal midnerve, acute, awnless, strongly laterally compressed; perennial with extensively creeping stolons or rhizomes. The generic name is derived from Kuon meaning dog and odous meaning tooth, referring to the hard, pointed scales of the rhizomes.

Cynodon dactylon (L.) Pers., Syn. Pl. 1:85. 1805. BERMUDA GRASS, WIRE GRASS.

C. dactylon is a common lawn grass in the Southwest. It has the unfortunate character of turning yellow-brown each fall and remaining thus during the winter months. It is not grown widely in Albuquerque because other more desirable species, which will remain green the year round, will grow here. Bermuda grass is very drought resistant and will grow well in alkaline soils. It thrives in unshaded areas, but will not withstand long periods of freezing temperature. On irrigated lands it makes a very good pasture or hay grass. Bermuda grass has escaped from cultivation and spread widely throughout the Southwest. A specimen was collected from the campus of the University of New Mexico next to the foundation of the Biology Building. It is common in lawns, cultivated fields, and moist, sandy soil.

Selected synonyms: Panicum dactylon L., Sp. Pl. 58. 1753.

Capricla dactylon Kuntze,

Rev. Gen. Pl. 2:764. 1891.

Eleusine Gaertn.

Spikelets sessile in two rows on one side of a broad, flattened rachis, the rachilla disarticulating above the glumes and between the florets; spikelets with few to several perfect florets; glumes unequal, broad, 1-nerved, shorter than the lemma of the first floret; lemmas acute with two short lateral nerves and a broad, green, compound midnerve; seed is loosely enclosed in the pericarp; annuals with usually two to several spikes in digitate clusters at tips of culms, occasionally scattered below. The name is derived from Eleusis, the town where Demeter was worshipped.

Eleusine indica (L.) Gaertn., Fruct. et Sem. 1:8. 1788.

GOOSEGRASS.

E. indica was collected in moist, watered ground of the University of New Mexico golf course. Goosegrass is common in the Eastern United States, but is found in the Southwest only in lawns, roadside ditches, and other artificially watered habitats.

Parkella Gaertn. Suntaxa.

Rev. Gen. Pl. 2:764. 1891.

Elusine Gaertn.

Spikelets sessile in two rows on one side of a broad, flattened rachis, the rachilla disarticulating above the glumes and between the florets; spikelets with few to several perfect florets; glumes unequal, broad, 1-nerved, shorter than the lemma of the first floret; lemmas acute with two short lateral nerves and a broad, green, compound midnerve; seed is loosely enclosed in the perical; annuals with usually two to several spikes in digitate clusters at tips of culms, occasionally scattered below. The name is derived from Elusis, the town where Demeter was worshipped.

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GOOSEGRASS.

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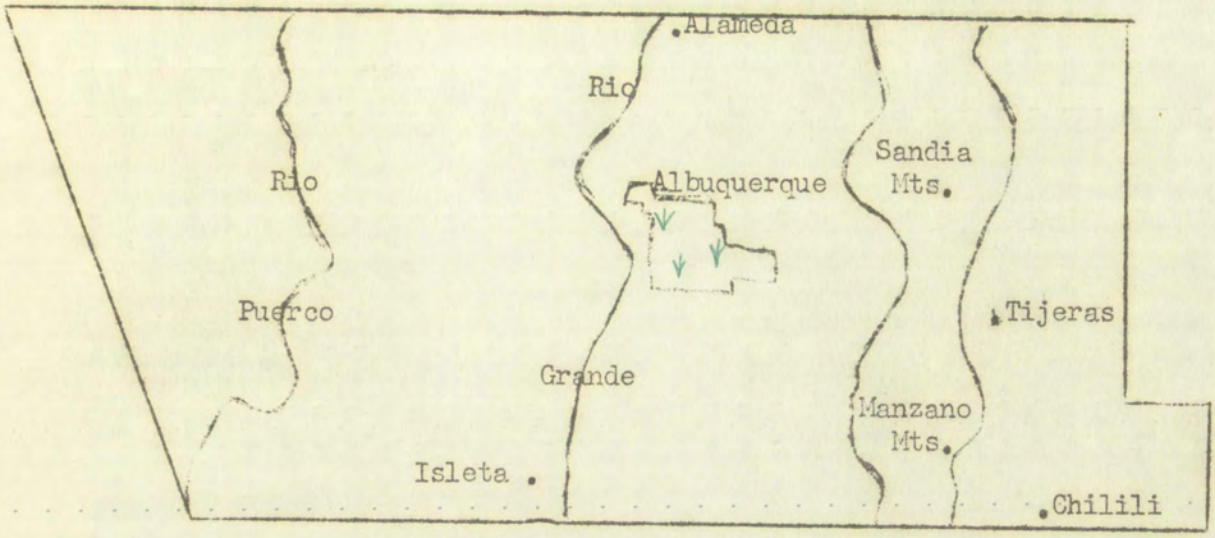

Fig. 55 Distribution of Eleusine indica

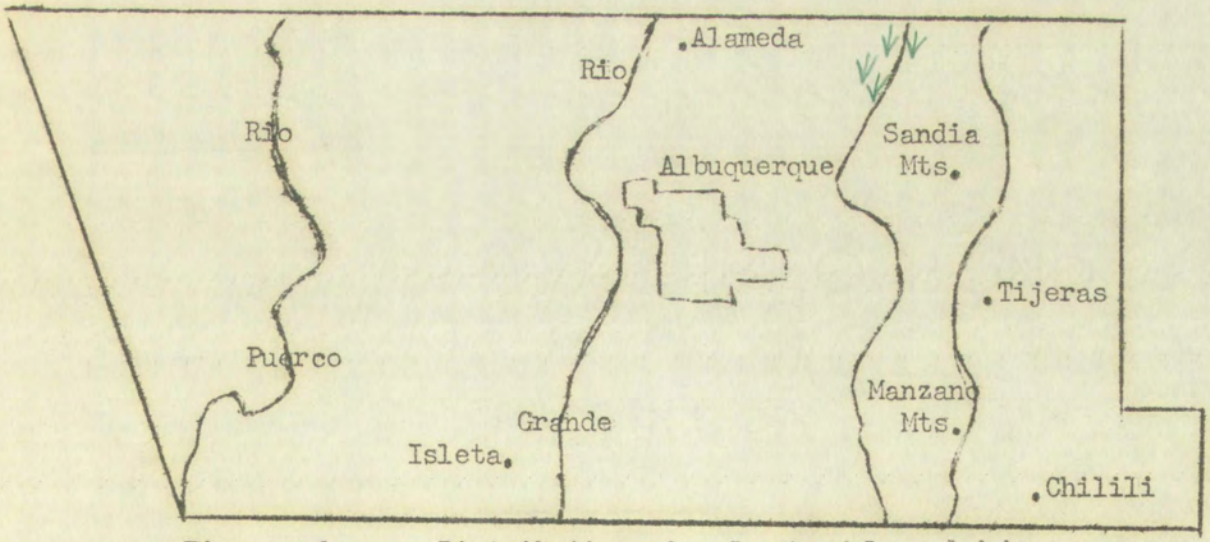

Fig. 56 Distribution of Leptochloa dubia

Selected synonyms: Cynosurus indicus L., Sp. Pl. 72. 1753.

Cynodon indicus Raspial, Ann. Sci. Nat., Bot. 5:303. 1825.

Leptochloa Beauv., SPRANGLE TOP.

Spikelets two to several flowered, sessile or short-pediceled, on one side of rachis; rachilla disarticulating above the glumes and between the florets; glumes subequal, awnless, 1-nerved; lemmas 3-nerved, occasionally pubescent along the nerves, sometimes short-awned from between the teeth of a bifid apex; annuals or perennials with few to many one-sided spikes loosely clustered near apex of the culm. The name comes from the Greek leptos meaning slender and chloa meaning grass, alluding to the slender spikes of the inflorescence.

Leptochloa dubia (H. B. K.) Nees, Syll. Pl. Ratisb. 1:4. 1824. GREEN SPRANGLETOP.

L. dubia was collected in sandy soil among huge boulders in Jaral Canyon five and one-half miles east of U. S. Highway 85 and one-fourth mile south of the Sandoval-Bernalillo County Line. It is found in association with

Muhlenbergia Porteri. Green sprangletop is of considerable value as a forage grass on the open range and grows well in dry, rocky hills of the arid Southwest region. It is sometimes cut for hay.

Selected synonyms: Chloris dubia H. B. K., Nov. Gen. et Sp. 1:169. 1816.

Diplachne dubia Scribn., Torrey Bot. Club Bul. 10:30. 1883.

Leptochloa Pringlei Beal, Grasses N. Amer. 2:436. 1896.

Schedonnardus Steud.

Spikelets 1-flowered, sessile in two rows on one side of a slender, 3-angled rachis; spikelets distant, slightly sunken in the concave sides of the rachis; rachilla disarticulating above the glumes; glumes narrow, unequal, 1-nerved; lemmas narrow, stiff, 3-nerved; perennial with slender, divaricate spikes, few and distant, on a common axis. The name is derived from the Greek words schedon meaning near and Nardus, a genus of grasses, because the panicle of Schedonnardus is very similar in general appearance to the panicle of Nardus and was originally interpreted as being related to it.

Muhlenbergia Porteri. Green sprangletop is of considerable value as a forage grass on the open range and grows well in dry, rocky hills of the arid Southwest region. It is sometimes cut for hay.

Selected synonyms: *Muhlenbergia dubia* H. B. K., Nov. Gen. et Sp. 1:169. 1816.

Muhlenbergia mubia Scribn., Torrey Bot. Club Bul. 10:70. 1883.

Muhlenbergia Porteri Scribn., Torrey Bot. Club Bul. 10:70. 1883.

Muhlenbergia Wrightii Scribn., Gramina N. Amer. 2:436. 1896.

Sohedonnardus Steud.

Spikelets 1-flowered, usually in two rows on one side of a slender, 3-angled rachis; spikelets sessile, slightly sunken in the concave side of the rachis; rachilla disarticulating above the glumes; glumes narrow, unequal, 1-nerved; lemmas narrow, stiff, 3-nerved; paleas with slender, divaricate spikes, few and distant, on a common axis. The name is derived from the Greek words *sanedon* meaning rear and *Bardus*, a genus of grasses, because the panicle of *Sohedonnardus* is very similar in general appearance to the panicle of *Bardus* and was originally interpreted as being related to it.

Schedonnardus paniculatus (Nutt.) Trel., in Branner and Coville, Rept. Geol. Survey Ark. 1888:236. 1891.

TUMBLEGRASS.

S. paniculatus was collected in moist soil of the University of New Mexico golf course, but is not found commonly in Bernalillo County. The inflorescence becomes curved and brittle at maturity, and often breaks, forming a tumbleweed. It usually inhabits open woodlands, dry plains, and waste places.

Selected synonyms: Lepturus paniculatus Nutt., Gen. Pl. 1:81.1818.

Schedonnardus texanus Steud., Syn. Pl. Glum. 1:146. 1854.

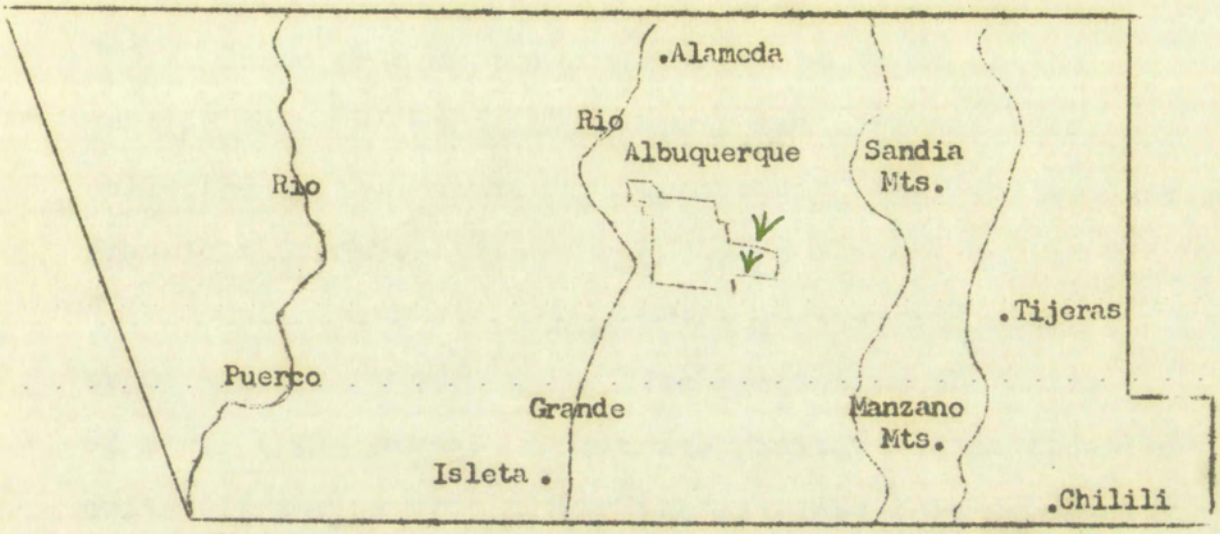

Fig. 57 Distribution of Schedonnardus paniculatus

GRASSES EXPECTED TO BE FOUND IN BERNALILLO COUNTY BUT NOT REPORTED

These grasses are expected to be found in the general range of Bernalillo County but have not been collected by the author nor reported in other collections from this county.

In the genus Aristida there are several plant types which have been split into species on the basis of minor differences. This makes positive identification quite difficult. The author has examined this group with considerable caution and, as a result, has possibly lumped a few closely related forms into one species. There are four species of Aristida that one would expect to find in this county but have not been reported. Two absentees are Aristida barbata, which probably has been grouped with Aristida divaricata, and Aristida pansa, which closely resembles Aristida Wrightii. Aristida glauca and Aristida purpurea are two species commonly reported from the southwestern ranges but are yet unreported from this county.

Muhlenbergia is a very large genus with as many as forty species reported from the southwestern United States. Most notable omissions from collections in

this county are two annuals, Muhlenbergia filiformis and Muhlenbergia depauperata, and two perennials, Muhlenbergia polycaulis and Muhlenbergia repens.

Phleum alpinum, mountain timothy, is not reported from this county, but one might expect to find it in the open meadows at the crest of the Sandia Mountains.

Sporobolus Neallyi and Sporobolus flexuosus closely resemble Sporobolus cryptandrus. Quite likely, if collected, they have been grouped into the one species Sporobolus cryptandrus. Sporobolus pulvinatus, an annual, has a general range which indicates its possible presence in this county.

Stipa Scribneri, Stipa Pringlei, Stipa neo-mexicana, and Stipa Lettermani are reported from wooded hillsides in Arizona and parts of New Mexico, and possibly may extend into Bernalillo County.

Several species of the genus Bouteloua are rather common in this county, but a few unreported species are Bouteloua chondrosoides, Bouteloua trifida, and Bouteloua Rothrockii.

Future collectors in Bernalillo County may discover some of these above species as their range indicates they may inhabit this area but not in any significant numbers.

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APPENDIX

PLATE I. PARTS OF A TYPICAL GRASS

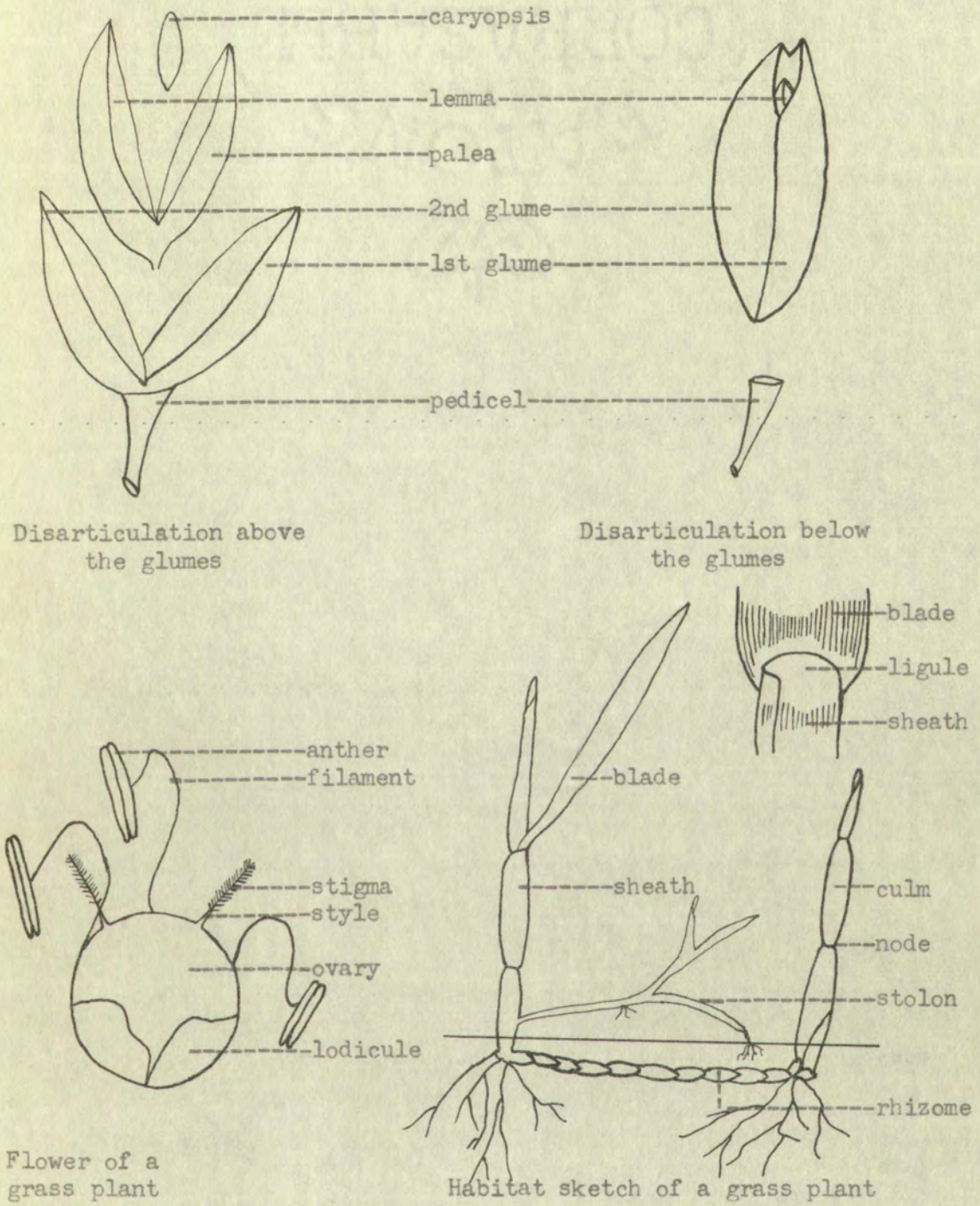

PLATE I. Parts of a typical grass

GLOSSARY

Acuminate. Gradually tapering to a long point.

Acute. Ending in a sharp point, but less tapering than acuminate.

Apex. Tip or distal end.

Apices. Plural of apex.

Appressed. Lying flat against an organ.

Aristate. Bearing a bristlelike awn.

Auricle. An earlike lobe found in pairs at summit of the sheath in some grasses.

Awn. A slender bristle extending from the tip or back of an organ; commonly a continuation of the midnerve or lateral nerves of the glumes or lemmas.

Awn column. The undivided lower portion of the trifid awn present in the genus *Aristida*.

Axial. Referring to the main axis from which lateral appendages arise.

Bidentate. Two-toothed.

Bifid. Two-cleft or two-lobed.

Blade. The part of the leaf above the sheath.

Callus. The hard, thickened basal extension of the lemma of certain grasses.

Capitate. In a headlike cluster.

Caryopsis. The one-seeded grain or fruit of grasses in which the seed coat is fused with the pericarp.

Ciliate. Bearing a fringe of hairs on the margin.

Culm. Stem of the grass plant.

Deciduous. The regular and repeated seasonal process of breaking and falling of some part of a plant.

Decumbent. Curved upward from a horizontal base, applying to culms.

Dichotomous. Type of branching in which each branch divides into two equal branches.

Diffuse. Widely and loosely spreading, applying to panicles.

Digitate. Radiating from the apex of a stalk, as the fingers from the hand.

Disarticulation. Separation at a joint of two parts at maturity.

Disclimax. An ecological term applying to a region that has been disturbed by man or domesticated animals.

Divaricate. Divergent or widely spreading.

Erose. Irregularly and minutely toothed as if gnawed.

Exserted. Protruding beyond an enclosing structure.

Flexuous. Zigzag; bending alternately in opposite directions.

Floret. A unit of the spikelet consisting of a lemma, a palea, and the included reproductive organs of the flower.

Fugacious. Falling before maturity; early deciduous.

Caryopsis. The one-seeded grain or fruit of grasses in which the seed coat is fused with the pericarp.

Cilia. Bearing a fringe of hairs on the margin.

Culm. Stem of the grass plant.

Deciduous. The regular and separated seasonal dropping of branches and foliage of some part of a plant.

Decumbent. Curved upward from a horizontal base, applying to culms.

Dichotomous. Type of branching in which each branch divides into two equal branches.

Diffuse. Widely and loosely spreading, applying to panicles.

Divisate. Radiating from the apex of a stalk, as the fingers from the hand.

Dissection. Separation at a joint of two parts at maturity.

Disturbed. An ecological term applying to a region that has been disturbed by man or domesticated animals.

Divaricate. Divergent or widely spreading.

Erect. Irregularly and minutely bentend as if gnawed.

Exserted. Projecting beyond an enclosing structure.

Flexuous. Zigzag, bending alternately in opposite directions.

Floret. A unit of the spikelet consisting of a lemma, a palea, and the included reproductive organs of the flower.

Fugacious. Falling before maturity; early deciduous.

Geniculate. Bent abruptly, as an elbow or knee.

Glabrous. Smooth, without hairs of any kind.

Glume. A sterile bract; one of the two empty bracts at the base of most grass spikelets, the lower called the first glume, the upper, the second glume.

Hirsute. Bearing coarse, stiff hairs.

Hispid. With rigid or bristly hairs.

Hyaline. Thin, colorless, transparent or translucent.

Imbricate. Overlapping, as shingles on a roof.

Indurate. Hard.

Inflorescence. The flowering part of a plant.

Internerve. The space between two nerves, as in a lemma or glume.

Internode. The section of stem or culm between two successive nodes.

Interrupted. A break in the continuity such as breaks or gaps occuring in otherwise dense and continuous inflorescences.

Involute. Rolled inward from the edges.

Keel. A central dorsal fold of a laterally compressed sheath, blade, glume, lemma, or palea; a palea often has two such folds on either side of the mid-dorsal line.

Lemma. The lower of the two bracts enclosing the reproductive organs of the grass flower; sometimes called the flowering glume.

Insinuate. Seat sharply, as an elbow or mass.

Jigsaw. Smooth, without notch of any kind.

Lines. A stretle through one of the two angry areas on the base of each upper petal; the lower called the first lines, the upper, the second lines.

Mitrate. Pointed, scarce, and 1/2 palm.

Nasute. With right or bristly hairs.

Nectar. Pipe, edifices, ornament or wanhiscens.

Lacinate. Overlapping, as a tingle on a roof.

Indurate. Hard.

Inflorescence. The flowering part of a plant.

Interstice. The space between two nerves, as in a leaves or plane.

Intercrop. The section of stem or rule between two successive nodes.

Interrupted. A break in the continuity such as stamts or pest occurring in otherwise dense and continuous inflorescences.

Involute. Rolled inward from the edge.

Keel. A central dorsal fold of a laterally compressed sheath, blade, glume, lemma, or palea; a petal often has two such folds on either side of the mid-dorsal line.

Lemma. The lower of the two bracts enclosing the reproductive organs of the grass flower; sometimes called the flowering glume.

Ligule. A thin appendage or ring of hairs on the inside of a leaf at the junction of sheath and blade.

Membranous. Thin, translucent.

Monoecious. Flowers unisexual; staminate and pistillate flowers borne on same plant.

Mucro. A short, abrupt tip.

Mucronate. Abruptly tipped with a short, straight point.

Nerve. A vascular vein of blade, glume, or lemma.

Node. The point of attachment of a leaf to a stem; a slightly swollen joint of a culm.

Obovate. Egg-shaped, with the broader end near the apex.

Palea. The upper of the two bracts enclosing the reproductive organs of the grass flower.

Panicle. An inflorescence with a main axis and subdivided branches.

Pectinate. Like the teeth of a comb.

Pedicel. The stalk of a spikelet.

Pedicellate. Having a pedicel; not sessile.

Peduncle. The stalk or support of an inflorescence.

Perfect. Applied to flowers having both stamens and pistil.

Persistent. Remaining attached for a long period of time; opposite of deciduous.

Pilose. With soft, shaggy hairs.

Plumose. Feather-like, with fine hairs on each side.

Ligule. A thin appendage or ring of hairs on the inside of a leaf at the junction of sheath and blade.

Membranous. Thin, transluscent.

Monoecious. Flowers unisexual; staminate and pistillate flowers borne on same plant.

Mucro. A short, abrupt tip.

Mucronate. Abruptly tipped with a short, straight point.

Nerve. A vascular vein of blade, glume, or lemma.

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Perfect. Applied to flowers having both stamens and pistils.

Persistent. Remaining attached for a long period of time, opposite of deciduous.

Pilose. With soft, straight hairs.

Plumose. Feather-like, with fine hairs on each side.

Pubescent. With short, soft, downy hairs.

Raceme. An inflorescence with pediceled spikelets arising along a common axis or rachis.

Rachilla. The axis of a spikelet upon which the florets are inserted.

Rachis. The central axis of a spike or a raceme.

Retrorse. Directed backward, forming greater than a 90° angle with the axis.

Rhizome. An underground stem or rootstock bearing scales, nodes and internodes.

Rudimentary. Underdeveloped.

Scaberulous. Minutely scabrous.

Scabrous. Rough to the touch because of the presence of short, stiff hairs or minute projections.

Scarious. Thin, dry, membranous, not green.

Sessile. Without a pedicel or stalk.

Sheath. The lower portion of the grass leaf which envelops the stem.

Spicate. Spikelike.

Spike. An unbranched inflorescence in which the spikelets are sessile on the main axis.

Spikelet. The unit of the grass inflorescence, usually consisting of two glumes and one or more florets inserted on a short axis, the rachilla.

Spikelike. Applied to a dense, contracted panicle that resembles a spike because the pedicels and panicle branches are very short and hidden by the spikelets.

Subequal. Nearly equal.

Stigma. The part of the pistil which receives the pollen, usually distal in location.

Stolon. A runner; a creeping, propagating, above-ground stem.

Style. The usually slender portion of the pistil that connects the stigma and the ovary.

Terete. Cylindrical; circular in transverse section.

Throat. The inner or ventral surface of a grass leaf at the junction of the blade and sheath.

Trifid. Divided into three parts as the awns of *Aristida*.

Truncate. Ending abruptly, as if cut off transversely.

Tubercle. A small, rounded projection.

Undulating. Wavy.

Verticillate. In whorls, many branches radiating in a circle around an axis.

Villous. Bearing long, soft hairs.

Spikelike. Applied to a spike, contracted panicle that resembles a spike because the pedicels and panicle branches are very short and hidden by the spikelets.

Subequal. Nearly equal.

Stigma. The part of the pistil which receives the pollen, usually distal in location.

Stolon. A runner; a creeping, prostrate, above-ground stem.

Style. The usually slender portion of the pistil that connects the stigma and the ovary.

Terete. Cylindrical; circular in transverse section.

Throat. The inner or ventral surface of a grass lemma at the junction of the blade and sheath.

Trifid. Divided into three parts as the awns of Aristida.

Truncate. Ending abruptly, as if cut off transversely.

Tubercle. A small, rounded projection.

Undulating. Wavy.

Verticillate. In whorls, many branches radiating in a circle around an axis.

Villous. Bearing long, soft hairs.

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INDEX

*denotes synonym

Artistida
adegemonia
*Bromoidea
*auxiliaris
divaricata
*fasciculata
fendleriana
*Hassonii
longipeta
*longiseta fendleriana
longiseta var. robusta
*Palmeri
*purpurea robusta
*submutica
tristrictii
*Athenopsoron
*Bartlettoidea
*curtipendula
*oligostachya
Avenaceae
Blepharoneuron
tricholepis
*Bothriochloa
*saccharoidea
Bouteloua
aristidoides
barbata
*brevifolia
curtipendula
eriopoda
gracilis
hirsuta
*hirtiflora
hirtiva
*hitchcockii
*microstachya
*oligostachya
*parryana
*polystachya
*prostrata
*pseudoglandulosa
*radicosa
simplex
*uniflora
*Calamagrostis
*Cenchrus
*Chloris
*Cynodon
dactylon

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