

OKLAHOMA
AGRICULTURAL AND MECHANICAL COLLEGE
AGRICULTURAL EXPERIMENT STATION
Lippert S. Ellis, Acting Director

GRASSES OF OKLAHOMA

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Stillwater, Oklahoma

ERRATA

- Page 6, No. 6: For "*Leptochlea*" read "*Leptochloa*."
- Page 10, No. 3 (second line): For "*E. colona*" read "*E. colonum*."
- Page 11, in "Distribution" of *Phalaris caroliniana* (Walt.):
For "*Stewens*" read "*Stevens*."
- Page 23, No. 2b: For "*Elymus canadensis* ar. *brachystachys*"
read "*Elymus canadensis* var. *brachystachys*."
- Page 28: For "*Cynodon Dactylon* . . . etc." read "*Cynodon dactylon* (L.) Pers. (*Capriola dactylon* Kuntz.) Bermuda Grass."
- Page 41, No. 13: For "*Aristida divaricata* Humb. and Bonpl." read "*Aristida divaricata* Humb. and Bonpl."
- Page 65, No. 3: For "*Triodia elongata*" read "*Triodia elongata*."
- Page 67, No. 11 (third line): For "ekels" read "keels."
- Page 71, No. 9 and Fig 81: For "*Eragrostis sessilispicata*" read "*Eragrostis sessilispica*."
- Page 84, first line at top of page: For *Melica nitens* (Nutt.) read "*Melica nitens* (Scribn.) Nutt."
- Page 106, No. 12, third line of description: For "within white margins" read "with white margins."
- Page 117, No. 2: For "*Erianthus* . . . etc." read "*Erianthus alopecuroides* (L.) Ell. (*E. divaricatus* (L.) Hitchc.) Silver Plume-grass."
- Page 123, No. 8: For "(*A. torreanus* Steud.)" read "*A. torreyanus* Steud.)"

PREFACE

The grass family needs no introduction. Nor is it necessary to cite the service to mankind of the agricultural members of this family: wheat, corn, oats, rice, sorghum, sugar cane, bamboo, and the other cultivated grasses. Many of the wild grasses, too, have won our respect through their value as forage, their service in conserving soil and moisture and their usefulness in occupying waste land and helping to restore its fertility. Some of them have commanded our attention because of their harmful activities, interfering with agriculture as weeds, poisoning livestock, or harboring the germs of disease.

The present interest in grasses in connection with the program for reclaiming eroded land has brought to a head the growing need for a complete and authoritative handbook of the Oklahoma grasses. This need is indicated by the many requests for grass identification which are received annually by the Botany Department at Stillwater. Field workers and farm and ranch owners are frequently faced with problems which require identification of the grasses. Time, money, and embarrassment would be saved if these workers could be supplied with some means of identifying Oklahoma grasses in the field. Grass manuals for certain other states are available, but they are not entirely suitable for use in Oklahoma. This is due to the geographic position of the state, which serves as a common meeting place for hardy, northern grasses, semi-tropical grasses, moist-land grasses and grasses which are adapted to dry prairie conditions.

This need has been met by the timely appearance of Dr. Featherly's handbook, culminating twelve years of research on the grasses of Oklahoma. The manual is designed especially for the use of county agricultural agents, Smith-Hughes teachers, soil-conservation workers, extension workers, ranch owners, and progressive farmers, since it is these groups who have particularly voiced the demand for such a reference book. The handbook describes, locates, and in many cases illustrates the 235 species and varieties of grasses which have been found to occur within the state. A very useful feature of the manual is the inclusion of original keys for rapidly locating the descriptions of unknown grasses. In a number of cases the grasses have not been previously known to occur within the state. One of the grasses included is a new species which was discovered in the course of the work.

An attempt has been made to simplify the technical language as much as possible, but in the interest of economy and accuracy a number of technical terms are used in the descriptions of the various grass species. A glossary of these terms is included at the end of the text. The keys for identifying grasses are thus adapted for the use of anyone who has had an elementary training in botany.

The handbook has a double function: it is a means for rapidly identifying the grasses of the state, and it is a reference record of the names and locations of the grasses which naturally occur in the state. It represents at once a useful and much-needed tool for Oklahoma agricultural workers, and a lasting contribution to our scientific knowledge of the grasses.

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GRASSES OF OKLAHOMA

INTRODUCTION

In this bulletin there are described 73 genera, 232 species and 24 varieties. The descriptions of the wild and escaped grasses have all been made from Oklahoma specimens. Where there was only one or a few specimens of a species at hand, or where the specimens in question were only fragmentary, other works have been consulted as regards variations and missing parts. The distribution records are far from being complete at present and there are perhaps other species yet to be found, but it seems expedient at this time to publish the known species in the State with their known distribution. The cultivated grasses have been added in the hope that it would be of assistance to cereal and forage investigators of the State.

The plan followed is that of Hitchcock's "Genera of Grasses." The keys, down to and including genera, are modified keys of the same publication. The key to the species of *Panicum* is a modification of that found in "North American Species of *Panicum*," by Hitchcock and Chase. In nomenclature, the author has followed the international rules and has included only enough synonymy to enable one to check with other standard works.

The splendid cooperation of other workers over the State has made possible the completion of this work much sooner than was anticipated and the author here wishes to acknowledge the valuable assistance of Dr. George J. Goodman of Iowa State College for helpful suggestions and technical advice; of Drs. P. B. Sears and the late R. E. Jeffs in checking the grasses in the University of Oklahoma Herbarium, and the loaning of specimens; of the late C. W. Prier of the Northeastern State Teachers College for distribution records; of Mr. T. C. Carter and Miss Anna B. Fisher of Northwestern State Teachers College for distribution records; of Dr. Elbert L. Little, Jr., for the loan of his collection of Muskogee county grasses, and of Messrs. T. R. Stemen and W. S. Myers of Central High School, Oklahoma City, for distribution records and loan of specimens.

The author also wishes to acknowledge the help received from the late Dr. A. S. Hitchcock and Mrs. Agnes Chase of the National Herbarium for the identification of doubtful species, the loan of specimens and for valuable suggestions and helpful criticisms of the manuscript.

GRASS-LIKE PLANTS

There are two families of plants, sedges (Cyperaceae) and rushes (Juncaceae), whose members are often quite easily mistaken for grasses (Gramineae), hence it is necessary to know how to separate these two families from the grasses. The sedges have stems which are more or less triangular and usually solid. The leaf sheaths are rarely split and the leaves are three ranked. In the grasses the stems are round or oval and hollow or solid with solid nodes or joints. The sheaths are usually split and the leaves are two ranked. The rushes differ from the grasses and sedges in that they have a six parted perianth and a compound pistil while in grasses and sedges the perianth is absent or of scale-like structures and the pistils are simple.

Gramineae Juss

Annuals or perennials with hollow (sometimes solid) stems and prominent nodes; leaves 2-ranked, linear, parallel veined, usually with a split sheath clasping the stem; inflorescence a spike, panicle or spike-like raceme; spikelets of two glumes and one or more perfect (rarely imperfect) florets; flowers without calyx or corolla borne in the axil of a bract (the lemma) and subtended by a second bract (the palea), the flower with its lemma and palea being termed the floret, or in maturity a fruit.

KEY TO SUB-FAMILIES

Spikelets 1-many flowered, sterile florets terminal if present
(except in Phalarideae(; disarticulated above the glumes;
spikelets more or less compressed with the glumes on
the edges Festucoideae

Spikelets 1-flowered, terminal floret perfect (except in
monoecious grasses); disarticulated below the glumes;
spikelets more or less flattened with the glumes
on the sides Panicoidae

Key to Tribes of Festucoideae

1. Plants woody; stems perennial Bambuseae
Plants herbaceous; stems annual 2
2. Spikelets with 2 sterile minute lemmas below floret Phalarideae
Spikelets without sterile lemmas below floret 3
3. Spikelets unisexual, both sexes borne in same panicle Zizanieae
Spikelets perfect, usually disarticulated above glumes 4
4. Spikelets very flat, 1-flowered, disarticulated below glumes Oryzaceae
Spikelets disarticulated above glumes (rarely below) 5
5. Spikelets, 1-flowered (or the staminate 2-flowered) in
groups (short spikes) of 2 to 5; the groups racemose along
a main axis, falling entire; lemma and palea thinner
than the glumes Zoysieae
Spikelets not as above 6
6. Spikelets sessile (short pedicelled in *Leptochlea*) on a
disarticulating rachis 7
Spikelets pedicellate (sessile and distant in *Eragrostis*
sessilispica) 8
7. Spikelets on opposite sides of rachis; spike solitary Hordeae
Spikelets on one side of rachis; usually more than
1 spike Chlorideae
8. Spikelets 1-flowered Agrostideae
Spikelets 2 to many flowered 9
9. Glumes as long as first floret, lemma often awned on
back Aveneae
Glumes shorter than first floret, awnless or awned
from tip Festuceae

Key to Tribes of Panicoidae

1. Glumes membranaceous, fertile lemma and palea
indurate Paniceae
Glumes indurate; fertile lemma and palea hyaline,
membranaceous 2
2. Spikelets unisexual, both sexes in same or separate
inflorescences Tripsaceae
Spikelets in pairs, one sessile and perfect, other
pedicellate, staminate, neuter, or wanting Andropogoneae

KEY TO THE GENERA OF BAMBUSEAE

One genus of this tribe known for Oklahoma Arundinaria

KEY TO THE GENERA OF PHALARIDEAE

One genus of this tribe known for Oklahoma Phalaris

KEY TO THE GENERA OF ZIZANIEAE

One genus of this tribe known for Oklahoma Zizaniopsis

KEY TO THE GENERA OF ORYZEAE

One genus of this tribe known for Oklahoma Leersia

KEY TO THE GENERA OF ZOYSIEAE

One genus of this tribe known for Oklahoma Hilaria

KEY TO THE GENERA OF HORDEAE

1. Spikelets one at each node of the rachis 2
- Spikelets more than one at each node of the rachis 6
2. Spikelets placed edgewise to the rachis Lolium
- Spikelets placed flatwise to the rachis 3
3. Plants perennial Agropyron
- Plants annual 4
4. Spikelets turgid or cylindric Aegilops
- Spikelets compressed 5
5. Glumes ovate, 3-nerved Triticum
- Glumes subulate, 1-nerved Secale
6. Spikelets 3 at each node of rachis, 1-flowered, only the middle spikelet fertile; rachis disarticulating Hordeum
- Spikelets 2 at each node of the rachis, 2 to 6 flowered 7
7. Glumes wanting or reduced to bristles, spikelets horizontal at maturity Hystrix
- Glumes usually well developed, spikelets appressed or ascending Elymus

KEY TO THE GENERA OF CHLORIDEAE

1. Plants dioecious or monoecious, low stoloniferous
- perennials Buchloe
- Plants with perfect flowers 2
2. Spikelets with more than 1 perfect floret 3
- Spikelets with only 1 perfect floret, often imperfect floret above 5
3. Head or capitate panicle almost hidden in sharp-pointed leaves Munroa
- Inflorescence exerted 4
4. Spikes numerous, slender, racemose on elongate axis Leptochloa
- Spikes few, stout, digitate or nearly so, on very short axis Eleusine
5. Spikelets without imperfect florets above; axis sometimes prolonged 6
- Spikelets with 1 or more imperfect florets above perfect one 9
6. Rachilla articulate below glumes; spikelets thick, densely imbricated Spartina
- Rachilla articulate above glumes; spikelets slender 7
7. Spikes digitate; rachilla prolonged Cynodon
- Spikes racemose along main axis; rachilla not prolonged 8
8. Spikes slender, divaricate, axis loosely spiral Schedonnardus
- Spikes short and rather stout, appressed; axis not spiral Willkommia
9. Spikes in whorls or nearly so or crowded at apex of stem Chloris
- Spikes racemose along a main axis 10

10. Spikelets distant, appressed, spikes slender, elongated *Gymnopogon*
Spikelets crowded, not appressed; spikes short and stout *Bouteloua*

KEY TO THE GENERA OF AGROSTIDAE

1. Rachilla articulate below glumes, these falling with spikelet 2
Rachilla articulate above glumes 4
2. Spikelets in pairs, one perfect, the other staminate
or neuter *Lycurus*
Spikelets all alike 3
3. Glumes long awned *Polyopogon*
Glumes awnless 5
4. Panicle dense and spike-like, glumes united toward base *Alopecurus*
Panicle not dense or spike-like, glumes not united toward base ... 6
5. Panicle narrow; lemma with twisted awn from toothed
apex *Limnodea*
Panicle open, nodding; lemma with minute straight
awn below entire apex *Cinna*
6. Fruit indurate, terete, awned, nerves obscure 7
Fruit thin, or firm, if firm the nerves prominent or evident 8
7. Awn trifid, lateral sometimes short *Aristida*
Awn simple, persistent, long, twisted and bent *Stipa*
8. Glumes longer than the lemma 9
Glumes shorter than lemma (awn tips longer in
Muhlenbergia racemose) 10
9. Panicle dense, spike-like, cylindrical or ellipsoidal *Phleum*
Panicle open, spreading *Agrostis*
10. Lemma awned from tip, or mucronate, 3 to 5 nerved 11
Lemma awnless or awned from the back 12
11. Rachilla prolonged behind the palea; florets
pedicellate *Brachyelytrum*
Rachilla not prolonged behind the palea; florets sessile *Muhlenbergia*
12. Florets with hairs at base; panicle open *Calamovilfa*
Florets without hairs at base; open or closed panicle ... *Sporobolus*

KEY TO THE GENERA OF AVENEAE

1. Florets 2; lower perfect, awnless; upper staminate, awned ... *Holcus*
Florets 2 or more, alike except upper ones reduced 2
2. Articulation below the glumes, spikelets falling entire 3
Articulation above the glumes, glumes similar in shape 4
3. Lemmas, at least the upper, with a conspicuous bent awn;
glumes nearly alike *Trisetum*
Lemmas awnless or the upper with a short awn; second
glume much wider than the first *Sphenopholis*
4. Spikelets several flowered; lemmas bifid at apex; awns
conspicuous, flat, bent *Danthonia*
Spikelets 2-flowered, sometimes with a rudimentary third floret 5
5. Spikelets large, glumes more than 1 cm. long *Avena*
Spikelets less than 1 cm. long 6
6. Lemmas keeled, awn when present above the middle 7
Lemmas convex awned from below the middle *Deschampsia*
7. Rachilla joints very short, glabrous or minutely pubescent;
lemmas awnless or with straight awn from toothed apex ... *Koeleria*
Rachilla joints slender; lemmas with dorsal bent awn ... *Trisetum*

KEY TO THE GENERA OF FESTUCEAE

1. Tall stout reeds; panicles plume-like; leaves distributed along stems 2
Low or rather tall grasses, rarely over 15 dm. tall 3
2. Lemmas naked; rachilla hairy *Phragmites*
Lemmas hairy; rachilla naked *Arundo*
3. Plants dioecious, stems erect from creeping rootstocks *Distichlis*
Plants not dioecious (except in some *Poa* and one species of *Eragrostis*) 4
4. Lemmas 3-nerved; nerves prominent often hairy 5
Lemmas 5 to many nerved; nerves sometimes obscure 9
5. Lemmas pubescent on nerves or callus (except in *Triodia albescens*); awned or mucronate 6
Lemmas not pubescent on nerves or callus (inter-nerve sometimes pubescent); awnless 8
6. Nerves glabrous; callus densely hairy, panicle large diffuse *Redfieldia*
Nerves hairy, at least below, lateral ones often conspicuously so 7
7. Annuals; palea long-ciliate on upper half *Triplasis*
Perennials; sometimes villous but not long-ciliate on upper half *Triodia*
8. Lemmas chartaceous; grain large, beaked, forces lemma and palea open *Diarrhena*
Lemmas membranaceous, if firm, the grain neither large or beaked *Eragrostis*
9. Spikelets with 1-4 sterile lemmas below fertile floret, nerves obscure *Uniola*
Spikelets with no sterile lemmas below fertile florets 10
10. Lemmas keeled on back 11
Lemmas rounded on back (slightly keeled towards summit in *Bromus* and *Festuca*) 13
11. Spikelets strongly compressed, crowded in one-sided clusters at the ends of stiff panicle branches *Dactylis*
Spikelets not strongly compressed or crowded in 1-sided clusters 12
12. Lemmas awned from minutely bifid apex (awnless in *Bromus unioloides*); spikelets more than 1 cm. long *Bromus*
Lemmas awnless; spikelet small *Poa*
13. Glumes papery, upper florets sterile; lemmas strongly nerved *Melica*
Glumes not papery; upper florets not unlike others 14
14. Nerves of lemma parallel; lemmas awnless, mostly obtuse *Glyceria*
Nerves of lemma converging at summit; lemmas awned or pointed 15
15. Lemmas entire, awned from tip *Festuca*
Lemmas awned or awn-tipped from a minutely bifid apex—*Bromus*

KEY TO THE GENERA OF PANICEAE

1. Spikelets subtended or surrounded by 1 to many bristles 2
Spikelets not subtended by bristles 3
2. Bristles barbed, united into a bur-like involucre, the whole falling with spikelets inclosed *Cenchrus*
Bristles persistent, not united, the spikelets deciduous *Setaria*

3. Glumes or sterile lemmas awned from the tip (awns reduced to a point in *E. colona*)..... *Echinochloa*
Glumes and sterile lemmas awnless..... 4
4. Fruit cartilaginous-indurate, lemma with hyaline margins 5
Fruit chartaceous-indurate, rigid..... 6
5. Spikelets in slender racemes more or less digitate at summit of culms *Digitaria*
Spikelets in diffuse panicles..... *Leptoloma*
6. Spikelets with back of fruit turned away from rachis of racemes, usually solitary 7
Spikelets with back of fruit turned toward rachis of spike-like racemes, or pedicellate in panicles..... 9
7. First glume and rachilla joint forming a swollen ringlike callus below the spikelet *Eriochloa*
First glume present or wanting, not forming a ringlike callus below the spikelet..... 8
8. First glume present (next to axis); racemes racemose along main axis *Brachiaria*
First glume wanting; racemes digitate or subdigitate..... *Axonopus*
9. First glume typically wanting; spikelets plano-convex, subsessile in spike-like racemes *Paspalum*
First glume present; spikelets usually in panicles 10
10. Second glume inflated-saccate, this and sterile lemma much exceeding stipitate fruit..... *Sacciolepis*
Second glume not inflated-saccate *Panicum*

KEY TO THE GENERA OF TRIPSACEAE

1. Steminate and pistillate spikelets in separate inflorescences *Zea*
Staminate and pistillate spikelets in same inflorescence *Tripsacum*

KEY TO THE GENERA OF ANDROPOGONEAE

1. Spikelets all perfect, surrounded by a copious tuft of soft hairs *Erianthus*
Spikelets unlike, sessile perfect, pedicellate sterile or staminate 2
2. Pedicel thickened, appressed to thickened rachis; spikelets awnless *Manisuris*
Pedicel not thickened nor appressed to thicken rachis; spikelets usually awned..... 3
3. Racemes of several to many joints, solitary, digitate or aggregate *Andropogon*
Racemes reduced to 1-few joints, panicle subsimple or compound 4
4. Pedicellate spikelets staminate *Sorghum*
Pedicellate spikelets wanting, pedicel only present..... *Sorghastrum*

ARUNDINARIA Michx.

Tall reedy plants with perennial woody stems; flowers in loose racemes or panicles; blooms infrequently.

1. *Arundinaria gigantea* (Walt.) Chapm. Giant Cane.

Stems woody, 5-9 m. tall, branched above; sheaths ciliate on the margin; blades lanceolate, 3 dm. long or less, the larger 2-3 cm. wide, those on the ultimate divisions smaller and crowded at the summit of the branches; spikelets 3.5-6 cm. long, on slender more or less leafy branches, lemmas glabrous or pubescent, acuminate.

Distribution: Virginia, Kentucky, Missouri, and Oklahoma southward. **Oklahoma:** LeFlore Co., Stevens; McCurtain Co., Featherly.

Remarks: This species is found along creeks, river banks and swampy regions where it forms "cane-brakes." The stems are used for fishing poles, bean poles, trellises, magazine racks, easels and similar articles.

PHALARIS L.

Annuals in Oklahoma species; stems erect, smooth; sheaths shorter than the internodes; blades flat; ligule conspicuous; inflorescence a spike-like or capitate panicle; spikelets crowded, 1-flowered; glumes equal or sub-equal, boat-shaped, winged keel; two small, hairy, sterile lemmas below the fertile lemma.

Glumes narrowly wing keeled, 4-6 mm. long 1. *P. caroliniana*

Glumes strongly wing keeled, 6-8 mm. long 2. *P. canariensis*

1. *Phalaris caroliniana* (Walt.) Carolina Canary-grass.

Stems 3-12 dm. tall, erect; sheaths shorter than the internodes; blades 5-15 cm. long, 4-10 mm. wide; ligule conspicuous; panicle spike-like, 3-10 cm. long, oval to oblong; spikelets 5-6 mm. long; glumes sub-equal, the lower shorter.

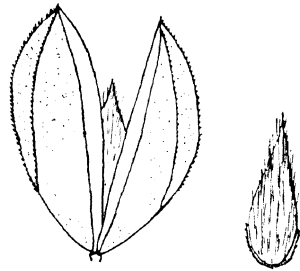


Fig. 1. *Phalaris caroliniana*

Distribution: South Carolina, Missouri, Oklahoma and California; southward.

Oklahoma: Fort Sill, English; Logan Co., Stevens; Muskogee Co., Little; Norman, Prier; Norman, Bruner; Oklahoma Co., Stemen & Myers; Stillwater, Stratton; Swanson Co., Stewens; Woods Co., Stevens.

Remarks: This plant is found on moist soil and along roadsides. In some places it furnishes quite a bit of forage. Summer.

2. Phalaris canariensis L. Canary Grass.
Bird-seed-grass.

Stems 3-9 dm. tall, erect, smooth; sheaths shorter than the internodes; blades 5-20 cm. long, 4-6 mm. wide, rough; ligule conspicuous; panicle ovoid to oblong, 2-4 cm. long, 1.5-2 cm. wide; spikelets 6-8 mm. long; glumes equal with strongly winged keels.

Distribution: Nova Scotia and Ontario to Georgia and Oklahoma. **Oklahoma:** Oklahoma City, Offutt-Steffey Seed Co.

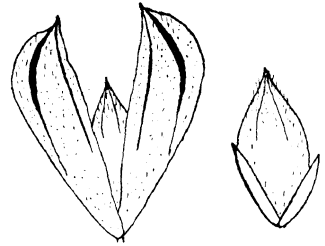


Fig. 2. *Phalaris canariensis*

ZIZANIOPSIS Doel. & Aschers.

Tall, robust, perennial, monoecious, aquatic grasses with stout creeping rootstocks, long flat blades and terminal panicles.



Fig. 3. *Zizaniopsis miliacea*

Zizaniopsis miliacea (Michx.) Doell & Aschers. Zizaniopsis. Water Millet. Southern Wildrice.

Stems 1.5-4 m. tall from rootstock, glabrous; sheaths smooth and glabrous; blades 3-10 dm. long, smooth and glabrous; panicles 3-6 dm. long, narrow, branches erect; staminate spikelets 7-8 mm. long; pistillate spikelets 6-7 mm. long.

Distribution: Virginia, Ohio and Oklahoma southward. **Oklahoma:** Waldron, Ortenburger.

Remarks: Found in swamps and along the banks of streams. It furnishes food for water fowl and is grazed by livestock when the more palatable species are scarce.

LEERSIA Swartz

Marsh grasses with slender scaly rootstocks; stems decumbent at the base and often rooting at the lower nodes; blades flat; panicles open; spikelets 1-flowered, perfect, strongly flattened laterally; grain ovoid, free.

Panicle branches singly disposed.....1. *L. virginicus*
Panicle branches in whorls or approximately in pairs.....2. *L. oryzoides*

1. *Leersia virginicus* Willd.
(*Homalocenchrus virginica*
(Willd.) Britton.) White grass.

Stems 6-14 dm. long, slender, much branched, pubescent at nodes, decumbent, often rooting at the lower nodes; sheaths shorter than the internode; blades 5-20 cm. long, 4-10 mm. wide; panicle 1-2 dm. long, open, branches long, slender and one at a node, spreading; spikelets 3-4 mm. long; glumes absent; lemma one-sided boat-shaped, ciliate on the keel and margins; palea narrow ciliate.

Distribution: Maine, Ontario to the Dakotas south to Florida and Texas. **Oklahoma:** Cleo, Stevens; Fort Sill, English; Muskogee Co., Little; Norman, Prier; Norman, Stemen & Myers; Osage Co., Stevens; Stillwater, Featherly; Stillwater, Chambers; Stillwater, Stratton; Osage Co., Penn.

Remarks: This species is found in swamps and moist woods. It is of little economic importance. Spring to fall.



Fig. 4. *Leersia virginicus*
(U. S. D. A. Div. Agros.)

2. *Leersia oryzoides* (L.) Swartz. (*Homalocenchrus oryzoides* (L.) Pol.) Rice-cut-grass.

Stems 3-15 dm. tall, smooth often rooting at the lower nodes; sheaths shorter than the internodes; blades 5-20 cm. long, 5-15 mm. wide; panicle 1-2.5 dm. long, spreading, partly included at the base; branches ascending, the lower ones in whorls or pairs; spikelets about 4.5 mm. long, one-sided; glumes absent; lemma boat-shaped ciliate on the keel and margin.

Distribution: Found throughout the United States. **Oklahoma:** Fort Sill, English; Oklahoma Co., Steffen & Myers; Tahlequah, Prier; Osage Co., Penn.

Remarks: This species is an inhabitant of wet places. It is of little economic importance. Summer and fall.



Fig. 5. *Leersia oryzoides*
(U. S. D. A. Div. Agros.)

HILARIA H. B. K.

Perennials; stems solid, stiff with a terminal spike; spikelets in groups of 3, the groups falling from the rachis entire, central spikelet 1-flowered (occasionally 2-flowered), the lateral spikelets staminate, 2-flowered (occasionally 3-flowered); glumes coriaceous, those of the three spikelets forming a false involucre, more or less unsymmetrical, usually bearing an awn from one side about the middle; lemma and palea hyaline, about equal.

Cluster of spikelets not flabellate; glumes of lateral spikelets narrowed toward the tip.....1. *H. jamesii*

Cluster of spikelets flabellate; glumes of lateral spikelets broadest toward the tip.....2. *H. mutica*

Hilaria jamesii (Torr.) Benth. Galleta.

Stems erect or decumbent at the base, glabrous, nodes villous; rhizomes tough scaly; sheaths sparingly, villous around short membranaceous ligule; blades 2 to 5 cm. long, 2 to 4 mm. wide, soon involute; group of spikelets 6 to 8 mm. long, long-villous at base.

Distribution: Deserts and dry plains from Wyoming to Oklahoma and Texas, west of California. **Oklahoma:** Kenton, Featherly; Boise City, Barkley.

Remarks: This is an important range grass of the arid southwest. It appears in the Oklahoma Panhandle but is not abundant enough to be of importance.

2. Hilaria mutica (Buckl.) Benth. Tubosa Grass.

Stems from a rhizomatous base, 3 to 6 cm. tall, glabrous with pubescent nodes; blades rather stiff, 2 to 3 mm. wide; spikes 4 to 6 cm. long; spikelets about 7 mm. long; glumes of lateral spikelets unsymmetrical, widened toward a ciliated summit; glumes of fertile spikelets strongly keeled, terminating in narrow ciliate lobes and slender awns; lemma exceeds the glumes, mucronate between 2 rounded lobes.

Distribution: Oklahoma and Texas to Arizona and northern Mexico. **Oklahoma:** Harmon Co., Hopkins.

Remarks: Found on dry plains and hills. Rare in Oklahoma.

LOLIUM L.

Glabrous annual or perennial grasses, with flat blades and terminal spikes. Spikelets several flowered, solitary, sessile and alternate at the nodes of a continuous rachis, compressed, the edge of the spikelet toward the rachis; first glume on lateral spikelets wanting but present in the terminal; lemmas rounded on the back.

- | | |
|--|-------------------|
| 1. Glume longer than the spikelet..... | 1. L. temulentum |
| Glume shorter than the spikelet..... | 2 |
| 2. Lemmas awnless | 2. L. perenne |
| Lemmas awned | 3. L. multiflorum |

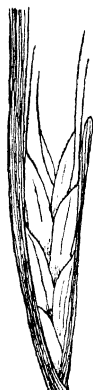


Fig. 6. *Lolium temulentum*

1. *Lolium temulentum* L. Darnel. Poison Darnel. Ivory. Tare. Cheat.

Annual; stems erect, 6-12 dm. tall, simple, sheaths variable in length; blades 1-3 dm. long, 3-6 mm. wide, rough above; spike 1.5-3 dm. long; spikelets 15-30, 5-8 flowered 1.5 cm. long; the glume striate extending beyond the florets; lemma 5-nerved, 7-8 mm. long bearing a straight awn almost twice its length.

Distribution: Eastern and central United States, also along the Pacific Coast. **Oklahoma:** Stillwater, Klages.

Remarks: In spite of its quite general distribution it is seldom common in any locality. It is listed as a poisonous plant, but there is some difference of opinion as to whether the grass is actually poisonous or whether the poisonous property is due to a fungus which is found on the grass.

2. *Lolium perenne* L. Ray-grass. Red Ray. Rye-grass. Ever-grass. English Rye-grass. Perennial Rye-grass.

Stems 1.5-8 dm. tall; blades 5-13 cm. long, 2-4 mm. wide; spike 7-20 cm. long; spikelets 5-10 flowered, 8-12 cm. long, glumes strongly nerved, lemma 4-6 mm. long, acuminate, awnless.

Distribution: Found throughout the northern and central United States. **Oklahoma:** Norman, Prier; Stillwater, Featherly.

Remarks: This plant is found in waste places, cultivated ground, and is sometimes sown as a forage crop. It does not rank high as a forage plant as there are many species more palatable. Naturalized from Europe. Summer.

3. *Lolium multiflorum* Lam. (*L. italicum* A. Br.) Awned Rye-grass. Italian Rye-grass. Australian Rye-grass.

Stems 6-9 dm. tall, glabrous, tufted; sheaths longer than the internodes; blades 1-2 dm. long, 3-8 mm. wide; spike 2-3 dm. long; spikelets 20-30, 14-20 mm. long; glume shorter than the spikelet, nerves prominent; lemmas awned.

Distribution: New York, New Jersey to Iowa and Oklahoma. **Oklahoma:** Stillwater, Learn; Tulsa, Malone.

Remarks: This species is found in fields and waste places. It is seldom grown for economic purposes. Naturalized from Europe. Summer.

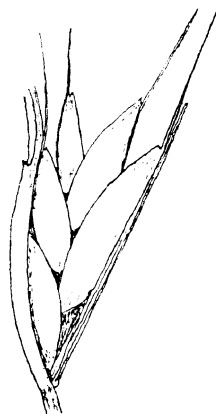


Fig. 7. *Lolium multiflorum*

AGROPYRON Gaertn.

Perennial grasses, with flat or involute blades and terminal spikes; spikelets 3-many flowered, single and alternate at each node of a continuous rachis; flat side of spikelet turned toward the rachis; lemmas rigid, round on the back, acute or awned at the apex; palea 2-keeled; grain pubescent at the apex.

1. Plants not densely tufted; plants with creeping rootstocks.....2
Plants densely tufted; no rootstocks1. *A. pauciflorum*
2. Glumes 5-11 nerved, not rigid, acute or abruptly awn-pointed2. *A. repens*
Glumes 1-3 (sometimes 5) nerved, rigid, gradually tapering
into a short awn.....3. *A. smithii*



Fig. 8. *Agropyron pauciflorum*

2. *Agropyron repens* (L.) Beauv. Couch-grass. Quitch-grass. Quack-grass.

Stems 3-12 dm. tall, from a running rootstock; blades 7-30 cm. long, and 2-10 mm. wide, smooth beneath, rough above; spike straight 1-2 dm. long; spikelets 3-7 flowered; glumes 5-7 nerved, acute or awn pointed; lemmas smooth and glabrous, acute or awn pointed.

Distribution: Found throughout most of North America. **Oklahoma:** Alva, Stevens; Cleo, Stevens; Fort Sill, English; Harmon County, Stevens; Hollis, Stevens; Major County, Stevens; Noble County, Featherly; Norman, Prier; Oklahoma County, Stemen & Myers; Ripley, Schultz; Stillwater, Stratton; Stillwater, Featherly; Woods County, Stevens.

1. *Agropyron pauciflorum* (Schwein.) Hitchc. (*A. tenerum* Vasey.) Slender wheat-grass.

Stems 5-10 dm. tall, smooth, erect, simple, slender; sheaths shorter than the internodes, glabrous; blades 10-30 cm. long, 2-6 mm. wide, flat or involute; spike slender, 8-15 cm. long; spikelets 3-5 flowered; glumes 8-12 mm. long, short awned or awn pointed, 3-5 nerved, scarious on the margins; lemma 10-12 mm. long, 5-nerved, short awned or awn-pointed.

Distribution: Newfoundland to British Columbia, south to Oklahoma, Colorado, and California. **Oklahoma:** Norman, Bruner.

Remarks: This grass is found on well-drained soils, and in some localities yields an abundance of good quality forage. Summer.



Fig. 9. *Agropyron repens*

Remarks: This species is quite palatable to livestock and furnishes a good quality of wild hay in some localities. In the corn belt regions it is considered a noxious weed. Naturalized from Europe. Summer.

3. *Agropyron smithii* Rydb. Western Wheat-grass.

Stems 4-10 dm. tall, erect from slender creeping rootstocks, smooth and glabrous; blades erect, 5-25 cm. long, 4-8 mm. wide, acuminate, very scabrous above, smooth beneath, becoming involute on drying; spike long exserted, strict, 10-20 cm. long; spikelets crowded, lanceolate when closed, 12-25 mm. long, 6-12 flowered; glumes acuminate, awn pointed, hispidulous on the keel; lemmas 10-12 mm. long, acute or awn-pointed.

Distribution: Manitoba, Minnesota to British Columbia, south to Missouri, Texas and Arizona. **Oklahoma:** Norman, Bruner; Oklahoma Co., Stemen & Myers; Stillwater, Learn; Osage Co., Penn.

Remarks: This plant grows on a variety of soils and withstands drouth well. It produces excellent hay where it is abundant enough.

AEGILOPS L.

Annuals, grasses with flat blades and cylindrical terminal spikes; spikelets 2- to 5-flowered, solitary, turgid and placed flatwise snugly in the notches of the rachis, the spikelets usually not reaching the next one on the same side; spikes falling entire at maturity.



Fig. 10. *Aegilops cylindrica*

Aegilops cylindrica Host. Wild Wheat. Jointed Goatgrass. Aegilops.

Stems about 6 dm. tall, erect, smooth, more or less tillering; sheaths smooth, shorter than the internodes; blades 1 dm. long or less, sparsely pubescent; spikes sub-cylindric 6-8 cm. long exclusive of awns; spikelets 2-flowered, appressed in the notches of the rachis which is thickened at the upper end of the internodes; glumes rough, 2-toothed with the tooth next to the rachis bearing a more or less curved awn 1-1.5 cm. long; the terminal spikelet with 3 slightly diverging awns about 5 cm. long. This description is based on a few immature specimens.

Distribution: Wheat growing sections. **Oklahoma:** Stillwater, Stratton.

Remarks: It is considered a weed in wheat fields. It has been introduced from Europe.

TRITICUM L.

Annual, low to rather tall grasses with flat blades and terminal spike; spikelets 2-5 flowered, solitary, sessile at each node of the rachis; glumes rigid, the apex mucronate, toothed or with 1-many awns; lemmas keeled or rounded on the back, the apex with one to several teeth or awns.

Triticum aestivum L. (*T. vulgare* Vill.) (*T. sativum* Lam.) Common Wheat.

Annual or winter annual; stems erect, simple, tillering, 6-12 dm. tall, glabrous or somewhat pubescent at the nodes; blades flat; spike stout, erect, awned or awnless; rachis not articulate at maturity; glumes shorter

than the spikelet, the keel awned or awnless; lemmas more or less 3-toothed, the middle tooth often awned; fruit creased on one side and pubescent on the outer end, about 5 mm. long.

Distribution: Found throughout the temperate regions of the world.

Oklahoma: Grown generally throughout the state, especially in the north-western part.

Remarks: This plant is one of the most important cereal plants.

SECALE L.

Tall, slender, glaucous annuals with simple stems, flat blades and a terminal spike; spikelets usually 2-flowered, compressed on alternate sides of a zig-zag rachis; glumes keeled, short awned; lemmas keeled bearing a long awn.

Secale cereale L. Common Rye.

Annual. Stems tufted 6-15 dm. tall, slender, erect, glaucous; sheaths smooth; blades flat 12 mm. wide or less, long pointed, rough above, smooth below. Spikes 1-1.5 dm. long, slender, long bearded; spikelets 2-3 flowered, first 2 fertile; glumes rigid, narrow, acuminate or awn pointed; lemma; 5-nerved, keeled terminating in a long awn; palea 2-keeled, shorter than the lemma.

Distribution: Grown more or less throughout the temperate regions of the world.

Remarks: Cultivated for grain in some sections of the United States and it is also used as a green manuring crop. The straw which is long and straight is often used for packing nursery stock for shipment.

HORDEUM L.

Annuals, winter annuals or perennials, with flat blades and terminal spikes; spikelets 1-flowered, rarely 2-flowered; usually in threes at each node of an articulate rachis, the lateral short-stalked and imperfect, rarely perfect; glumes rigid often reduced to awns and forming an apparent involucre around the spikelet; lemmas rounded on the back, 5-nerved at the apex, awned; palea scarcely shorter than the lemma, 2-keeled; lemma and palea usually adherent to the grain.

- | | |
|---|-----------------------|
| 1. Plants annuals or winter annuals | 2 |
| Plants perennial | 1. <i>H. jubatum</i> |
| 2. Glumes, or some of them, ciliate | 2. <i>H. murinum</i> |
| Glumes not ciliate | 3 |
| 3. Awn of lemma 12 mm. long or less | 3. <i>H. pusillum</i> |
| Awn of lemma 7-15 cm. long | 4. <i>H. vulgare</i> |

1. *Hordeum jubatum* L. Squirrel-tail Grass.

Stems tufted, slender and erect, 2-4 dm. tall; blades flat; spikes 5-10 cm. long, erect or nodding; glumes awn-like 3-5 cm. long; lemma of central spikelet 6-8 mm. long, terminating in a slender awn 3-5 cm. long.

Distribution: Throughout most of North America. **Oklahoma:** Alfalfa Co., Stevens; Ellis Co., Clifton; Ellis Co., Stevens; Major Co., Stevens; Norman, Prier; Watonga, Graff; Woods Co., Stevens.

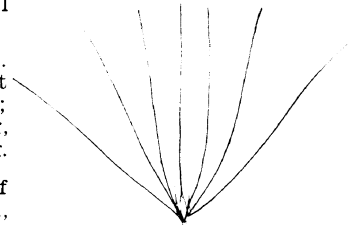


Fig. 11. *Hordeum jubatum*

Remarks: This species is found principally in saline soils. It is considered a weed, and often does mechanical injury to stock by the awns getting into their eyes. Summer.

2. *H. murinum* L. Mouse Barley.

Stems branches, spreading; sheaths and blades smooth; spike 5-7 cm. long, often partially included in the upper sheath; glumes of narrow spikelet narrow, 3-nerved, awn about 2.5 cm. long; glumes of lateral spikelets unlike, the inner ones similar to the central ones and the outer ones somewhat bristle-like; lemmas broad 8-10 mm. long with awns about as long as or longer than those of the glumes.

Distribution: Found throughout most of the United States. **Oklahoma:** Oklahoma City, Pritchard.

Remarks: The plant was introduced from Europe and has become a weed in open fields and waste places.

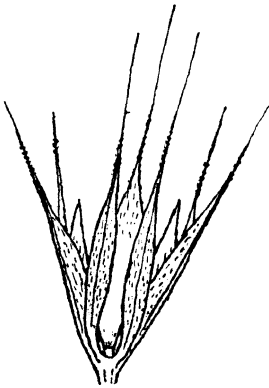


Fig. 12. *Hordeum pusillum*

3. *Hordeum pusillum* Nutt. Little Barley. June-grass.

Stems 1-4 dm. tall, erect or decumbent at the base; blades 3-8 cm. long, 1-4 mm. wide, erect; spike 2.5-8 cm. long; spikelets usually in threes, the central one containing a perfect flower, the lateral imperfect; glumes awned, scabrous; lemmas awned, smooth, that of the central spikelet 6-8 mm. long, short awned.

Distribution: British Columbia, Wyoming, Nebraska, Oklahoma, Texas, Louisiana, Tennessee and California. **Oklahoma:** Alfalfa Co., Stevens; Beaver, Hanly; Blaine Co., Stevens; Cimarron Co., Stevens; Fort Sill, English; Guthrie, Stevens; Muskogee Co., Little; Norman, Prier; Norman, Jeffs; Norman, Bruner; Oklahoma Co., Stemen & Myers; Watonga, Graff; Osage Co., Penn.

Remarks: This plant is considered a weed and since it is a winter annual it is a serious pest in fields of winter wheat. At maturity the spikelets cause considerable annoyance by sticking in the clothing. Summer.

4. *Hordeum vulgare* L. (*H. sativum* Pers.) Barley. Common Barley.

Stems erect, stout, simple, 5-10 dm. tall, glabrous except beneath the spike; blades broad and rather short with conspicuous claws; spike terminal usually erect, densely flowered, with many long, stout, erect, rough awns which extend beyond the spike. The grain is more or less tightly enclosed in the lemma and palea.

Distribution: Temperate regions of the world.

Remarks: This is a cultivated species and is grown as a cereal crop.

4a. *Hordeum vulgare* var. *trifurcatum* Alef. Hulless Barley.

This variety is awnless. The awns have been modified into short, furcate branches. The lemma and palea of this variety do not adhere to the grain as in common barley.

HYSTRIX Moench.

Usually tall grasses with flat blades and terminal spikes; spikelets 2-several flowered, in pairs (rarely in threes) at each node of the flattened, continuous rachis; glumes wanting or reduced to short awns; lemmas narrow, involute, rigid, rounded on the back, 5-nerved at the apex, terminating in an awn; palea almost as long as the lemma, 2-keeled.

Hystrix patula Moench. Bottle-brush Grass.

Stems 6-12 dm. tall, smooth, sheaths longer than the internodes; blades spreading, 1-3 dm. long, 8-12 mm. wide, tapering to both ends, scabrous; spike short exserted or partially included 6-12 cm. long; spikelets usually distant, at first erect but soon spreading widely, 1-1.5 cm. long excluding the awns; lemmas pubescent at least near the summit or nearly glabrous; awns 1.5-4 cm. long.

Distribution: New Brunswick, Ontario, Minnesota, Georgia, Illinois, Nebraska and Oklahoma. **Oklahoma:** LeFlore Co., Stevens, Page, Stevens; Muskogee Co., Little; LeFlore Co., Little and Olmstead.



Fig. 13. *Hystrix patula*

Remarks: This plant is found in moist more or less shady places. It is seldom abundant enough to be of importance. Summer.

ELYMUS L.

Tall grasses with dense terminal spikes; spikelets 2-6 flowered and set alternately at the nodes of a continuous zig-zag channeled rachis. The spikelets usually in pairs; glumes awned or awnless, attached obliquely and form an apparent involucre to the groups of spikelets; lemmas shorter, round on the back, 5-nerved, usually awned; palea 2-keeled, adherent to the grain; grain sparsely hairy at the summit.

- 1. Glumes narrowly lanceolate, broadened above the base..... 2
 Glumes subulate, not broadened above the base..... 3
- 2. Awns straight; base of glumes terete.....1. *E. virginicus*
 Awns curved out when dry, base of glumes not
 terete2. *E. canadensis*
- 3. Awns straight; lemmas about 1.2 mm. wide.....3. *E. villosus*
 Awns flexuous-divergent; lemmas about 2
 mm. wide4. *E. interruptus*

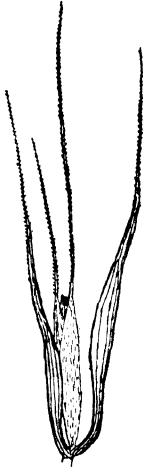


Fig. 14. *Elymus virginicus*

1. *Elymus virginicus* L. Terrell-grass.
Virginia Wild Rye.

Stems 6-9 dm. tall, smooth; sheaths sometimes pubescent, the top sheath often inflated and enclosing the base of the spike; blades 1-3.5 dm. long, 4-16 mm. wide, rough; spike 5-15 cm. long, stout, erect; spikelets 2-3 flowered; glumes thick, rigid, lanceolate, 1.5-2.5 cm. long including the awn; lemmas 6-8 mm. long, bearing an awn 4-18 mm. long, rarely awnless.

Distribution: Nova Scotia, Manitoba, Florida to Oklahoma. **Oklahoma:** Cleveland Co., Prier; Fort Sill, English; Grant Co., Stevens; Hinton, Stevens; Ingersoll, Stevens; Muskogee Co., Little; Muskogee Co., Pammel; Norman, Bruner; Norman, Stemen & Myers; Ottawa, Stevens; Stillwater, Stratton; Swanson Co., Stevens; Wood Co., Stevens; Claremore, Brunkow; Osage Co., Penn.

Remarks: This grass is usually found in patches in woods and along stream banks. It is seldom abundant enough to be of much importance, although it is grazed while young. Summer.

1b. *Elymus virginicus* var. *intermedius* (Vasey) Bush.

Spikes more bristly; glumes usually less bowed out; lemmas glabrous with awns more than twice their length.

Distribution: Maine, Pennsylvania and Iowa, south to Florida, Texas and New Mexico. **Oklahoma:** Guthrie, Dobson; McGregor, Jeffs; Muskogee Co., Little; Norman, Prier; Oklahoma Co., Stemen & Myers; Gowen, Clark; McCurtain Co., Little & Olmsted; McClain Co., Demaree.

1c. *Elymus virginicus* var. *intermedius* (Vasey) Bush.

Glumes, lemmas and rachis more or less hirsute.

Distribution: Thickets and low land from Maine to Iowa south to Texas and Florida. **Oklahoma:** Ottawa Co., Stevens; Cleveland Co., Eskew; Comanche Co., Demaree.

1c. *Elymus virginicus* var. *australis* (Schribn. & Ball) Hitchc.

Differs from *E. virginicus* var. *intermedius* in having a stouter, bristly spike and longer awns, and from *E. virginicus* var. *glabriflorus* in having hirsute or strongly scabrous glumes and lemmas.

Distribution: Vermont to Iowa south to Florida and Texas. **Oklahoma:** Muskogee Co., Little; Murray Co., Demaree; Noble Co., Eskew.

2. *Elymus canadensis* L. Nodding Wild Rye. Canada Lyme-grass.

Stems 6-15 dm. tall; blades 1-3 dm. long or more, 4-20 mm. wide, rough, sometimes glaucous; spike 1-3 dm. long, nodding, much exserted; spikelets 3-5 flowered; glumes awl-shaped, rigid, 3-5 nerved 1.6-3.2 cm. long including the slender, rough awn; lemmas 8-14 mm. long, nearly glabrous to hirsute; awn slender, rough, 2-5 cm. long.

Distribution: New Brunswick, Alberta, Georgia, Texas, Oklahoma to New Mexico. **Oklahoma:** Muskogee Co., Pammel; Norman, Prier; Norman, Bruner; Norman, Stemen & Myers; Stillwater, Stratton; Osage Co., Penn.

Remarks: This species is commonly found in moist places where it makes both good grazing and hay until it becomes woody. Summer.

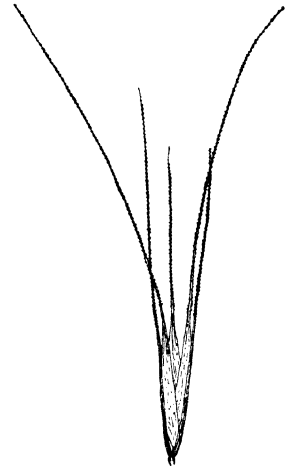


Fig. 15. *Elymus canadensis*

2a. *Elymus canadensis* var. *robustus* (Schribn. & Smith) Mackenz. & Bush.

More dense, erect, bristly spike partly included at the base.

Distribution: Montana, Illinois, Arkansas to Oklahoma. **Oklahoma:** Fort Sill, English; Harmon Co., Stevens; LeFlore Co., Blackley; Logan Co., Stevens; Ripley, Schultz; Stillwater, Stratton; Osage Co., Penn.

2b. *Elymus canadensis* ar. *brachystachys*. (Schribn. & Ball) Farwell. Lemmas glabrous or nearly so.

Distribution: Arkansas, Oklahoma, Texas and N. Mexico. **Oklahoma:** Cleveland Co., Jeffs.



Fig. 16. *Elymus villosus*

3. *Elymus villosus* Muhl. (*E. striatus* Willd.) Little Rye grass.

Stems 3-9 dm. tall, smooth; sheaths glabrous or hirsute; blades 1-2.5 dm. long, 4-10 mm. wide, pubescent above; spike 6-12 cm. long often nodding, slender; spikelets 1-3 flowered; glumes 2-2.5 cm. long, including the slender rough awn, 1-3 nerved, nerves and often the whole glume rough, hispid or hirsute; lemmas about 6 mm. long, hispid or hispidulous, awn slender 1.5-3 cm. long.

Distribution: Maine, Ontario, Wyoming south to Texas and Alabama. **Oklahoma:** Guthrie, Graff; Muskogee Co., Little; Norman, Prier; Norman, Bruner; Norman, Stemen & Myers; Tonkawa, Stevens; Kay Co., Stevens; Muskogee Co., Little; Canadian Co., Little.

Remarks: This species is found in wood-

lands and along stream banks. It is seldom abundant enough to be of much importance. Summer.

4. *Elymus interruptus* Buckl.

Stems 7 to 13 dm. tall, erect; lower sheaths longer than the internodes; blades 5-12 mm. wide, 10-25 cm. long; spike flexuous or nodding 8-20 cm. long, more or less interrupted by the presence of one or more reduced glumes; glumes setaceous, 1-3 cm. long, more or less flexuous; glumes about 1 cm. long with a flexuous or curved awn 1-3 cm. long.

Distribution: Scattered localities. Texas, Oklahoma, Wyoming, North Dakota, Minnesota, Wisconsin and Tennessee. **Oklahoma:** LeFlore Co., Stevens.

Remarks: Not abundant enough to be of any importance.

BUCHLOE Raf.

Perennial, creeping, stoloniferous, monoecious but sometimes apparently dioecious, grasses with two widely different forms of flowers. The staminate flowers consisting of one-sided spikes near the summit of a long exserted stem, while the pistillate spikelets are on very short stems and in clusters of 2 or 3 and are scarcely exserted from the uppermost sheath.

Buchloe dactyloides (Nutt.) Engelm.
(*Bulbilus dactyloides* Raf.) Buffalo Grass.
Early Mesquite.

Staminate stems 1-3 dm. tall, erect, slender; blades papillose-hirsute; spikes 1-3 cm. long, exserted; spikelets 4-5 mm. long, 2-3 flowered in 2 rows on short one-sided spikes, glumes 1-nerved, unequal; lemmas 3-nerved; palea 2-nerved.

Pistillate stems 1-8 cm. long papillose-hirsute, much exceeded by the blades; spikelets borne in clusters of 2 or 3 at the end of short stems; glumes indurated, trifid at the apex, united at the base forming an involucre; lemmas hyaline, enclosing a 2-nerved palea.

Distribution: Minnesota, Saskatchewan, south to Arkansas, Oklahoma, Texas, and Mexico. **Oklahoma:** Avard, Stevens; Fort Sill, English; Norman, Prier; Norman, Jeffs; Norman, Bruner; Payne Co., Featherly; Stillwater, Stratton; Osage Co., Penn.

Remarks: This grass is one of the important grazing plants on the plains. Summer.

MUNROA Torr.

Low, stoloniferous grasses with short, straight, divergent branches and short spiny pointed leaves which are crowded at nodes and ends of the branches. Spikelets almost hidden in the dense clusters of leaves.

Munroa squarrosa (Nutt.) Torr. Monroe's Grass. False Buffalo-grass.
Stems 5-20 cm. long, much branched; branches short, straight; sheaths short, loose; blades very short, spiny tipped; spikelets 2-5 flowered, lemmas 3-toothed, awned or awnpointed.

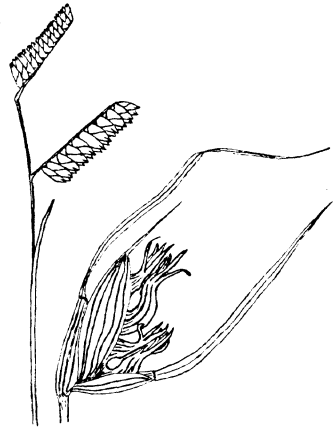


Fig. 17. *Buchloe dactyloides*

Distribution: South Dakota to Alberta, Nebraska, Oklahoma and Texas to Arizona. **Oklahoma:** Woods Co., Stevens.

Remarks: This plant is a grass of the plains. It is not abundant enough in Oklahoma to be of much importance. Summer and fall.

LEPTOCHLOA Beauv.

Usually tall annual grasses with numerous spikes forming a simple panicle. Spikelets usually 2-many flowered, flattened, alternating in 2 rows on one side of the rachis; glumes keeled, shorter than the spikelet; lemmas keeled, 3-nerved; palea 2-nerved; grain free, enclosed in the lemma and palea.

- | | |
|--|---------------------------|
| 1. Spikelets 6-10 mm. long | 2 |
| Spikelets 3 mm. long or less | 1. <i>L. filiformis</i> |
| 2. Lemma emarginate to truncate-erose at tip | 2. <i>L. dubia</i> |
| Lemma awn-pointed | 3. <i>L. fascicularis</i> |



Fig. 18. *Leptochloa filiformis*

1. *Leptochloa filiformis* (Lam.) Beauv. Slender Grass. Feather-grass. Salt-grass.

Stems 3-9 dm. tall, branched, smooth and glabrous; sheaths papillose-pilose above, glabrous below, longer than the internodes; blades 1-2 dm. long, 2-7 mm. wide, scabrous; spikes numerous, slender, rigid, long, spreading or ascending; spikelets usually 3-flowered, about 2 mm. long; glumes about as long as the spikelet, acute 1-nerved; lemmas 2-toothed at the apex, ciliate on the nerves.

Distribution: Virginia to Illinois to California south to Florida and Mexico. **Oklahoma:** Craig Co., Stevens; Fort Sill, English; Norman, Prier; Osage Co., Stevens; Stillwater, Featherly; Osage Co., Penn.

Remarks: This plant is known mostly as a weed, and is of but little economic value. Summer and fall.

2. *Leptochloa dubia* (H. B. K.) Nees. Prangle.

Perennial. Stems 2-7 dm. tall, smooth; sheaths smooth, lower ones loose compressed; blades 1-4 dm. long, 3 mm. wide or less, flat or involute; panicle 1-1.5 dm. long of spreading spikes; spikelets 5-8 mm. long, first shorter; lemma 4 mm. long, 3-nerved, truncate-erose.

Distribution: Florida to Oklahoma and Arizona southward into Mexico. **Oklahoma:** Fort Sill, English; Murray Co., Hopkins & Van Valkenburgh.

Remarks: This plant is rare in Oklahoma. Summer and fall.

3. *Leptochloa fascicularis* (Lam.) A. Gray. *Leptochloa*.

Stems 3-12 dm. tall, glabrous, simple or branched; sheaths loose, longer than the internodes, the upper one partly inclosing the panicle; blades long narrow, involute at tips; panicles 2-3 dm. long, of spike-like secund racemes; spikelets 8-12 mm. long, 5-11 flowered; glumes unequal, the first about 3 mm. long, the second 4-5 mm. long, scabrous on the keel; lemma about 6 mm. long exclusive of short awn.

Distribution: Massachusetts to Illinois and Oklahoma southward. **Oklahoma:** Fort Sill, English; Norman, Prier; Norman, Stemen & Myers; Ripley, Learn; Woods Co., Stevens; Osage Co., Penn.

Remarks: This species is usually found on sandy soil. It is of little economic importance. Summer.



Fig. 19. *Leptochloa fascicularis*

ELEUSINE Gaertn.

Tufted annuals or perennials with flat blades and spicate inflorescence; spikes digitate from the summit of the stem or sometimes an additional spike below; spikelets several flowered imbricated in two rows on one side of the rachis.

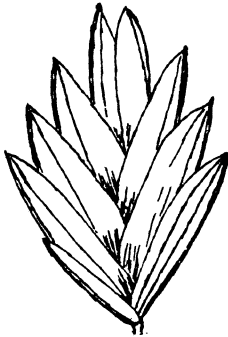


Fig. 20. *Eleusine indica*

Eleusine indica (L.) Gaertn. Wire-grass. Crab-grass. Yard-grass. Goose-grass.

Stems 1.5-6 dm. tall, branched, erect or decumbent; sheaths loose, ciliate on the margins; blades 5-30 cm. long, 2-10 mm. wide, smooth beneath papillose-hirsute above; spikes 3-8, digitate or approximate at the summit of stem; spikelets 3-4 mm. long and 3-6 flowered.

Distribution: Found throughout the United States. **Oklahoma:** Cleo, Stevens; Fort Sill, English; Guthrie, Graff; Muskogee Co., Little; Muskogee Co., Pammel; Norman, Prier; Norman, Jeffs; Norman, Bruner; Oklahoma Co., Stemen & Myers; Ottawa Co., Stevens; Stillwater, Featherly; Stillwater, Stratton; Osage Co., Penn.

Remarks: This plant is a weed in yards and waste places. Summer.

SPARTINA Schreb.

Perennials with tall, stout stems and large scaly rootstocks; blades flat or involute; inflorescence spicate; spikes secund and attached singly at the nodes of the axis; spikelets crowded in two rows on one side of the rachis.

Spartina pectinata Link. (*S. michauxiana* Hitchc.) Tall Marsh-grass. Slough-grass. Bull-grass. Cord-grass.

Stems 1-2 m. tall, erect, simple; sheaths longer than internodes; blades 6-10 dm. long, 8-15 mm. wide, attenuate, very scabrous on margins and quickly rolling up on drying; spikes 5-20, attached singly along the axis; spikelets imbricated in two rows on one side of the rachis; glumes unequal, awned, serrulate-hispid on the keel; lemma as long as first glume.

Distribution: From Colorado eastward. **Oklahoma:** Grant Co., Stevens; Harmon Co., Stevens; McClain Co., Stevens; Norman, Prier; Norman, Stemen & Myers; Perkins, Featherly; Stillwater, Featherly; Washington Co., Stevens; Watonga, Graff; Kingfisher, Byers; Osage Co., Penn.

Remarks: This grass is found in low, moist regions. It grows in patches which sometimes extend over a considerable area. It is grazed when young by livestock, but it soon becomes coarse and unpalatable. Summer and fall.



Fig. 21. *Spartina pectinata*

CYNODON Richard.

Low creeping perennials with ascending branches; inflorescence 4-5 secund digitate spikes from the apex of a branch; spikelets 1-flowered with the rachilla extending behind the palea.

Cynodon dactylon (L.)
Pers. Bermuda Grass. *Capriola dactylon* Knutz.

Stems creeping, rooting and branching at nodes, glabrous, branches ascending, 1-3 dm. tall; sheaths crowded, glabrous; ligule a ring of white hairs; blades 3-5 cm. long, flat, rough; inflorescence 4-5 secund spikes, digitate at the apex of the branches; spikelets about 3 mm. long, appressed.

Distribution: Massachusetts to Missouri and Oklahoma southward. **Oklahoma:** Found throughout Oklahoma except the northwest corner.

Remarks: Bermuda Grass is a good lawn grass and a good soil binder. It is however, a very bad weed in cultivated fields. Summer and fall.

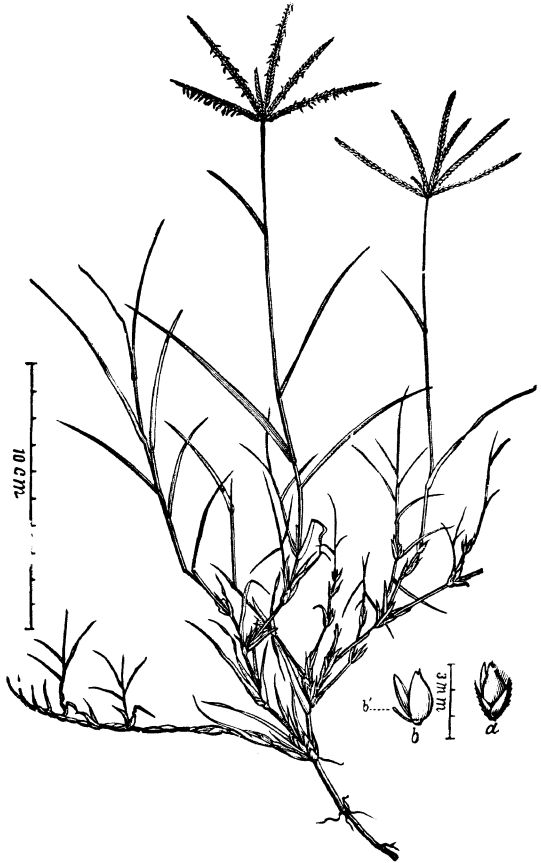


Fig. 22. *Cynodon dactylon*
(U. S. D. A. Div. Agros.)

SCHEDONNARDUS Steud.

Annual grasses with long slender spikes arranged along a common spiral triangular axis; spikelets 1-flowered, appressed, alternate, distant along two sides of a triangular rachis; glumes membranous unequal, acuminate; lemmas longer than the glumes.

Schedonnardus paniculatus (Nutt.) Trel. Schedonnardus. Wire-grass. Texas Crab-grass.

Stems 2-5 dm. tall, slender, erect, rigid, leafy below; sheaths crowded at the base of stem, smooth and glabrous; blades 2-5 cm. long, about 2 mm. wide; spikes solitary and remote, alternate on the concave sides of a triangular loosely spiral axis; the inflorescence breaking off at maturity and becoming a tumbleweed; spikelets about 4 mm. long, appressed, alternate on two sides of a triangular rachis.

Distribution: Montana, North Dakota and Illinois south to Texas and New Mexico. **Oklahoma.** Ellis Co., Clifton; Fort Sill, English; Norman, Prier; Oklahoma Co., Stemen & Myers; Payne Co., Stratton; Woods Co., Stevens; Osage Co., Penn.

Remarks: This grass is found on dry open ground. It is not considered an economic grass. Summer.

WILLKOMMIA Hack.

Spikelets 1-flowered, somewhat dorsally flattened, compressed in two rows on one side of a slender rachis, rachilla extended somewhat above and below the second glume. Articulation just above the second glume. The glumes are thin and unequal, the first narrow and nerveless, the second 1-nerved; lemma awnless, 3-nerved sparingly pubescent between the nerves, margins with silky hairs; nerves of palea silky hairy.

Willkommia texana Hitchc.

Stems more or less erect, 20 to 40 cm. tall; blades flat to involute; spikes few to several, 2 to 5 cm. long, appressed; spikelets about 4 mm. long, narrow, acute; first glume two-thirds as long as the second; lemma about as long as the second glume.

Distribution: Oklahoma to southern Texas. **Oklahoma:** Muskogee Co., Watson.

Remarks: Found on hard-pan. It is rare in Oklahoma.

CHLORIS Swartz.

Usually perennial grasses with flat blades and spicate inflorescence; spikes usually verticillate or nearly so on a common rachis or aggregate at the apex of the stem; spikelets 1-flowered (if 2-flowered, the terminal one sterile) arranged in two rows on one side of the rachis; glumes unequal, keeled; lemmas usually awned.

1. Lemma conspicuously ciliate-villous; spikes feathery -- 1. *C. virgata*
Lemma minutely ciliate on nerves or glabrous; spikes
not feathery ----- 2

2. Spikelets crowded; awn of fertile lemma about 1
mm. long ----- 2. *C. cucullata*
Spikelets not crowded; awn of fertile lemma 3-6
mm. long ----- 3. *C. verticillata*

1. *Chloris virgata* Swartz.

Stems 2-4 dm. tall, (perhaps taller) branched, smooth; sheaths thin, loose; blades 1 dm. long or less, thin; spikes 4-8, 4-5 cm. long terminal, erect or ascending; spikelets 2-flowered, the upper one sterile, flowers falling from glumes readily at maturity; glumes unequal, first 2 mm. long, second twice as long; lemma 3 mm. long with a crown of short hairs at the base, 3-nerved, nerves more or less hairy, the middle nerve terminat-

ing in a straight awn about 10 mm. long, a tuft of hairs 2 mm. long on either side of the awn; sterile flower pedicellate, the lemma bearing an awn about 8 mm. long.

Distribution: South and southwestern part of the United States.

Oklahoma: Fort Sill, English.

Remarks: This is a new grass in Oklahoma and little is known about it. Fall.

2. *Chloris cucullata* Bisch.

Stems erect or spreading at base, 2-5 dm. tall; sheaths keeled; blades folded; spikes attached at or near the apex of the stem, 2-5 cm. long, flexuous; spikelets crowded, about 2 mm. long and about as broad; lemma with awn about 1 mm. long.

Distribution: Plains and sandy places from Texas, southwestern Oklahoma to New Mexico. **Oklahoma:** Davidson, Oklahoma, on bank of Red River, collector unknown.

3. *Chloris verticillata* Nutt. Windmill-grass. Prairie Chloris.

Stems 2-5 dm. tall, erect or decumbent, rooting at the nodes; sheaths compressed; blades 2.5-8 cm. long, 2-4 mm. broad, rough above and on the margins; spikes numerous, spreading, 5-15 cm. long usually in whorls or approximate on an axis 1-5 cm. long, ciliate in the axils, the entire inflorescence breaking off at maturity and becoming a tumbleweed; spikelets 3 mm. long with awns about 5 mm. long; first glumes half as long as the second; lemma 2 mm. long, more or less ciliate on the nerves, especially the lateral ones, awn 5 mm. long.

Distribution: Missouri to Colorado and southward. **Oklahoma:** Caddo Co., Stevens; Fort Sill, English; Norman, Prier; Norman, Van Vleet; Norman, Bruner; Oklahoma Co., Stemen & Myers; Stillwater, Stratton; Stillwater, Featherly; Woods Co., Stevens; Love Co., Forbs; Oakwood, Price; Rocky, McCannon; Nardin, Smith; Osage Co., Penn.

Remarks: This species is found on the open prairies where it affords some grazing. Summer.

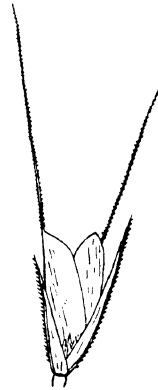


Fig. 23. *Chloris verticillata*

GYMNOPOGON Beauv.

Perennial grasses usually with short, flat, broad blades and a spicate inflorescence which is composed of long slender spikes arranged alternately on the axis; spikelets 1-flowered, rachilla extending and bearing a small scale which is usually awned; glumes unequal acute; lemma 3-nerved, slightly 2-toothed at the apex, bearing a straight awn.

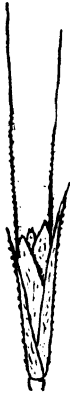


Fig. 24. *Gymnopogon ambiguus*

Gymnopogon ambiguus (Michx.) B. S. P.
Broad-leaved Beard-grass. Naked Beard-grass.

Stems 3-5 dm. tall, erect or sometimes decumbent at the base from scaly rootstocks; sheaths overlapping, crowded at or above base of stem; blades 2-10 cm. long, 4-12 mm. wide, lanceolate; spikes slender, spreading, lower ones often reflexed, 1-2 dm. long; spikelet bearing throughout entire length; spikelets exclusive of awn 4-5 mm. long; awn of lemma 4-6 mm. long.

Distribution: Southern New Jersey to Missouri, Oklahoma and southward. **Oklahoma:** Norman, Bruner; Oklahoma Co., Stemen & Myers; Stillwater, Featherly; Osage Co., Penn.

Remarks: This grass is found on dry sandy soil. It is not abundant enough to be of much economic value. Summer and fall.

BOUTELOUA Lag.

Annual or perennial grasses with narrow flat or involute blades; inflorescence composed of from 1-60 one-sided, often curved spikes, which are sessile or nearly so, few to many flowered, rachis sometimes prolonged beyond spikelets; spikelets 1-2 flowered crowded in 2 rows on one side of a flat rachis; lower flower perfect, upper one staminate or sterile; glumes acute, keeled; lemma broader with 3 awned or awn-pointed teeth.

- | | |
|---|----------------------------|
| 1. Spikes 1-several; spikelets numerous pectinately crowded on one side of rachis | 2 |
| Spikes several to many; spikelets not pectinate | 4 |
| 2. Spikelets papillose-hirsute | 3 |
| Spikelets not papillose-hirsute | 1. <i>B. gracilis</i> |
| 3. Rachis terminating in rudimentary spikelet; sterile pedicel with 2 tufts of hairs at top | 2. <i>B. pectinata</i> |
| Rachis extending beyond upper spikelet; sterile pedicel without tufts of hairs | 3. <i>B. hirsuta</i> |
| 4. Spikes 30-60, reflexed; spikelets 4-10, not crowded on scabrous rachis | 4. <i>B. curtispindula</i> |
| Spikes 3-10, spreading or ascending | 5 |
| 5. Spikes 5-10, spreading; spikelets few, crowded on a short hairy rachis | 5. <i>B. rigidiseta</i> |
| Spikes 3-8, ascending; spikelets numerous, ascending, not crowded | 6. <i>B. eriopoda</i> |

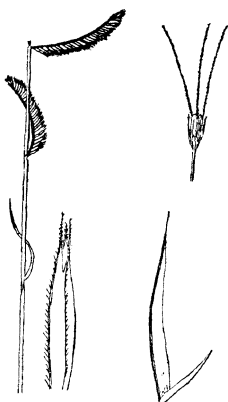


Fig. 25. *Bouteloua gracilis*

1. ***Bouteloua gracilis*** (H. B. K.) Lag.
Grama-grass. Mesquite-grass. Blue Grama.

Stems 1.5-5 dm. tall, erect simple smooth and glabrous; blades 2-10 cm. long, 2 mm. wide, involute at least near the long slender tip, smooth or scabrous; spikes 1-3, 2.5-5 cm. long, usually curved, the rachis ending in an inconspicuous point; spikelets about 6 mm long; rachilla with a tuft of long hairs under the rudimentary spikelet.

Distribution: Wisconsin to Alberta south to Texas and Mexico. **Oklahoma:** Chattanooga, Besemer; Custer Co., Stevens; Fort Sill, English; Norman, Prier; Stillwater, Stratton; Stillwater, Featherly; Wichita Mts., Stemen & Myers; Woods Co., Stevens; Rocky, McCannon; Enid, Hurst; Osage Co., Penn.

Remarks: This is one of the most important grasses of the plains. It cures well on the ground and furnishes good winter pasture. Summer and fall.

2. ***Bouteloua pectinata*** Featherly.
Hairy Mesquite-grass.

Stems 4-7 dm. tall, erect; blades 25 cm. long or less, flat or involute-atenuate toward the tip; sheaths smooth and glabrous; spikes 3-4, 3-5 cm. long on pubescent peduncles, rachis terminating in a rudimentary spikelet; spikelets 40-60 pectinate, 5-6 mm. long; glumes unequal, first 4 mm. long, second 5-6 mm. long papillose-hirsute; sterile pedicel with 2 tufts of hairs at upper end.

Distribution: Oklahoma and Texas. **Oklahoma:** Fort Sill, English; Indian Territory, Sheldon.

Remarks: This plant furnishes good grazing in the short grass regions of the southwest. Summer and fall.

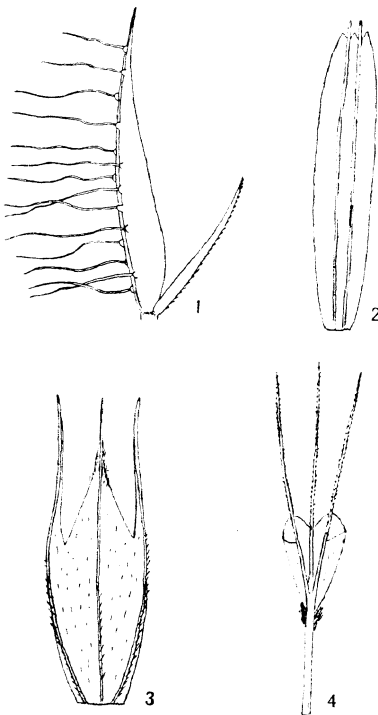


Fig. 26. *Bouteloua pectinata*
(Bot. Gaz.)

3. *Bouteloua hirsuta* Lag. Hairy Mesquite-grass. Hairy Grama.

Stems erect 1.5-5 dm. tall, smooth and glabrous; sheaths at the base loose and crowded; blades 2-13 cm. long, 2 mm. wide, erect, or ascending, flat, rough above, papillose-hirsute near the base; spikes 1-4, 1-4 cm. long, erect or ascending; rachis extends beyond spikelets in a conspicuous point; spikelets 5-6 mm. long.

Distribution: North Dakota to Illinois, Florida and Arizona. **Oklahoma:** Cleveland Co., Hefley; Fort Sill, English; Oklahoma Co., Stemen & Myers; Stillwater, Featherly; Wood Co., Stevens; Love Co., Forbs; Osage Co., Penn.

Remarks: This species is an important grazing grass of the plains. It cures well on the ground and affords winter pasture. Summer and fall.

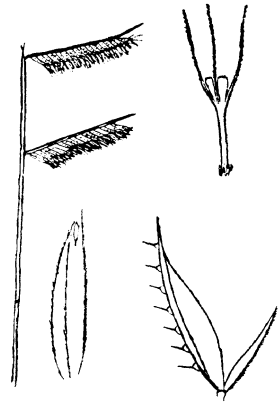


Fig. 27. *Bouteloua hirsuta*

4. *Bouteloua curtipendula* (Michx.) Torr. Tall Grama-grass. Side-oats. Grama.

Perennial; stems 3-10 dm. tall, tufted from short rootstocks; blades 5-30 cm. long, 4 mm. wide or less, flat or involute, rough above; spikes 6-16 mm. long, reflexed; spikelets 4-12 diverging from the rachis, 7-10 mm. long.

Distribution: Ontario, Manitoba to New Jersey southward into Mexico. **Oklahoma:** Chattanooga, Besemer; Cleveland Co., Prier; Fort Sill, English; Muskogee Co., Little; Noble Co., Jeffs; Oklahoma Co., Stemen & Myers; Payne Co., Featherly; Stillwater, Stratton; Watonga, Graff; Woods Co., Stevens; Rocky, McCannon; Enid, Hurst; Nardin, Smith; Claremore, Bunkow; Osage Co., Penn.

Remarks: This is a very beautiful grass. In spite of its wide distribution it perhaps reaches its highest development in the rocky plains regions where it affords considerable grazing. Summer and fall.

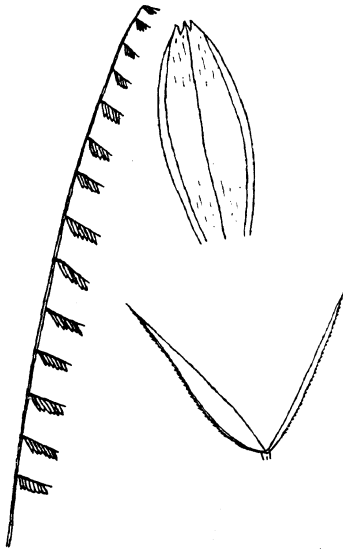


Fig. 28. *Bouteloua curtipendula*

5. *Bouteloua rigidisetia* (Steud.) Hitchc. (*B. texana* S. Wats.) Texas Grama.

Stems erect or sometimes decumbent at the base, 2-3 dm. tall; blades 3-18 cm. long, flat or involute, thinly pubescent on upper surface; spikes 5-10, 1-1.5 cm. long on an axis 4-6 cm. long; spikelets 4-6 crowded on a short hairy rachis; first glume 2 mm. long; second glume 3-5 mm. long, pubescent on the back, bifid, midnerve produced into awn 2 mm. long; lemmas 4-5 mm. long.

Distribution: Arkansas, Oklahoma and Texas. **Oklahoma:** Stillwater, Featherly; Swanson Co., Stevens; Love Co., Forbs; Payne Co., Penn.

Remarks: This species is not abundant enough to be of importance in Oklahoma.

6. *Bouteloua eriopoda* (Torr.) Torr. Black Grama.

Stems tufted, pubescent, 4-6 dm. long, slender, wiry, trailing by arched internodes; blades narrow flexuous; spikes 3-8, ascending, 2-4 cm. long; spikelets ascending, not crowded; second glume smooth on mid-nerve; sterile spikelet reduces to three awns with a tuft of hairs at the base.

Distribution: Western Oklahoma, western Texas to southern Utah and northern Mexico. **Oklahoma:** Cimarron Co., Goodman.

Remarks: Black grama is an important grazing grass in parts of its range but because of its scarcity in Oklahoma it is of no importance.

LYCURUS H. B. K.

Perennials; stems low to medium in height, wiry, erect or decumbent; panicle spike-like; spikelets born in pairs, the lower sterile; one-flowered; first glume 2-awned the second with one awn.

***Lycurus phleoides* H. B. K. Wolftail.**

Stems slender, simple or branched, 2-7 dm. tall; sheaths keeled; blades flat or folded, ascending, 5-12 cm. long; panicle 3-10 cm. long, about 5 mm. wide; spikelet 1-flowered; first glume 2-awned, second 1-awned; lemma 4 mm. long, exclusive of awn, more or less pubescent.

Distribution: Colorado, Texas and Arizona south to southern Mexico. **Oklahoma:** Boise City, Barkley; Cimarron Co., Demaree.

Remarks: This grass is found on the plains and in rocky ground where in some places it forms an important range grass.

POLYPOGON Desf.

Annual or perennial grasses with erect or decumbent stems; flat blades and dense spike-like panicles; spikelets 1-flowered; glumes equal, awned; lemma awned, often hyaline.

***Polypogon monspeliensis* (L.) Desf. Annual Beard Grass.**

Annual; stems 1-6 dm. tall, smooth, erect; sheaths loose, ligule conspicuous, hyaline; blades flat, rough; panicle dense, oblong, spike-like; spikelets crowded; glumes equal, about 2 mm. long, ciliate on margins, hispid on keel; awns 4-6 mm. long; lemma bearing an awn 2 mm. long or less.

Distribution: Maine to Georgia, Texas and Oklahoma and from British Columbia to Mexico. **Oklahoma:** Norman, Jeffs.

Remarks: This grass is found in fresh water streams and moist places where it may grow partly submerged. It is quite palatable to livestock. Summer and fall.

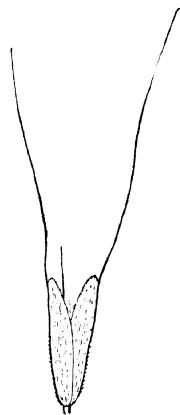


Fig. 29. *Polypogon monspeliensis*

ALOPECURUS L.

Annual or perennial grasses, stems erect or decumbent; inflorescence spicate; spikelets 1-flowered, flattened; glumes sometimes short awned, more or less united at the base, compressed, keeled; keel ciliate or sometimes winged; lemma hyaline, 3-nerved, awned on the back; palea hyaline or wanting.

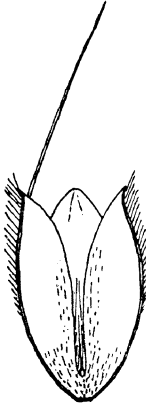


Fig. 30. *Alopecurus carolinianus*

Alopecurus carolinianus Walt. (A. geniculatus L. of most manuals covering Oklahoma.) Marsh Foxtail.

Stems 1.5-4.5 dm. tall, erect or geniculate at the base; blades 2-15 cm. long, 1-4 mm. wide, somewhat rough, especially above; spike 2-8 cm. long, 3-5 mm. in diameter, glumes compressed, ciliate keeled, united at the base; lemma shorter, smooth, glabrous. awn inserted on lower part and extending beyond spikelet 2 mm.

Distribution: Newfoundland to Kansas, south to Florida and Texas. **Oklahoma:** Alva, Stevens; Alfalfa Co., Stevens; Cherokee, Stevens; Fort Sill, English; Norman, Prier; Norman, Lousinger; Norman, Bruner; Oklahoma Co., Stemen & Myers; Payne Co., Stratton; Stillwater, Featherly; Whitehorse, Stevens.

Remarks: This grass is palatable and grazed closely, but it is short and not very abundant.

ARISTIDA L.

Tufted slender grasses with narrow, often involute rolled or bristle-like leaves; inflorescence a contracted or open panicle which often approaches a raceme; spikelets 1-flowered, narrow; glumes persistent, narrow, keeled, usually awnless, usually longer than the lemma; lemma narrow, rigid, bearing 3 awns.

- 1. Central awn spirally coiled at base, lateral straight 2
 Central awn not spirally coiled (sometimes loosely contorted below) 4
- 2. Lateral awns half to two-thirds as long as the central, the central somewhat spreading 1. *A. basiramea*
 Lateral awns much shorter than the central, 1-3 mm. long, erect 3
- 3. Glumes nearly equal, 6-8 mm. long, lemma 5-6 mm. long 2. *A. dichotoma*
 Glumes unequal, second longer, about 1 cm. long; lemma about 1 cm. long 3. *A. curtissii*
- 4. Plants annual 5
 Plants perennial 8
- 5. Awns mostly 4-7 cm. long, about equal, divergent 4. *A. oligantha*
 Awns mostly less than 2 cm. long, often unequal 6
- 6. Central awn with semicircular bend at base, spreading or reflexed 7
 Central awn not sharply curved, awns about equally divergent 5. *A. intermedia*

- 7. Lateral awns much reduced; lemma about 2
cm. long 6. *A. ramosissima*
- Lateral awns one-third to half as long as the
 central; lemma 4-5 mm. long 7. *A. longispica*
- 8. First glume one-half as long as the second 9
- First glume more than half as long as the second 11
- 9. Branches of panicle loose, nodding; slender
 and flexuous 8. *A. purpurea*
- Branches of panicle erect, stiff and appressed 10
- 10. Panicle usually more than 15 cm. long, branches
 several-flowered 9. *A. wrightii*
- Panicle usually less than 15 cm. long, branches
 few flowered 10. *A. fendleriana*
- 11. Sheaths lanate pubescent; central awn longer,
 horizontal or reflexed 11. *A. lanosa*
- Sheaths not lanate pubescent; some spreading 12
- 12. Panicle narrow, branches erect 12. *A. purpurascens*
- Panicle wide, diffuse, branches long spreading 13. *A. divaricata*

1. *Aristida basiramea* Engelm. Forked Triple-awned Grass. Beard-grass.

Stems 2-6 dm. tall, tufted, slender, branching; blades 3-15 cm. long, 1.5 mm. wide; panicle 3-9 cm. long, branches slender erect; spikelets 10-15 mm. long, first glume shorter than the second; lemma 7-11 mm. long; central awn spiral at the base with straight portion 10-18 mm. long; lateral awns more or less spreading, half to two-thirds as long as the central awn.

Distribution: Manitoba to Illinois, Nebraska and Oklahoma. **Oklahoma:** Norman, Prier; Norman, Stemen & Myers; Osage Co., Stevens; Oklahoma Co., Hopkins; Osage Co., Penn.

Remarks: This species is found on thin clay soil. It is quite unpalatable and hence is a poor grazing grass. Summer and fall.

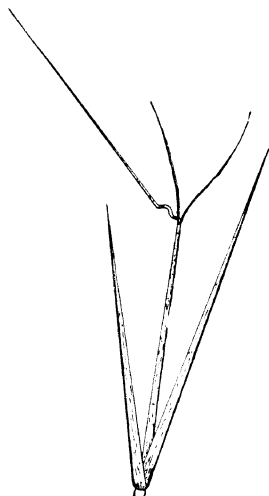


Fig. 31. *Aristida basiramea*

2. *Aristida dichotoma* Michx. Poverty Grass.

Stems 2-6 dm. tall, tufted, slender, dichotomously branched; blades 2-9 cm. long, 1.5 mm. wide, erect; panicle 3-7 cm. long; branches short, erect; spikelets 7-9 mm. long; glumes about equal or the first shorter; lemma 5-7 mm. long, lateral awns short erect, central awn spreading, spiral at the base, straight part 2-5 mm. long.

Distribution: Maine, Ontario to Nebraska southward. **Oklahoma:** Muskogee Co., Little; Osage Co., Penn.

Remarks: This plant is found on dry sandy soils. It is of no economic importance. Summer and fall.



Fig. 32. *Aristida dichotoma*

3. *Aristida curtissii* (A. Gray) Nash. Curtiss' Triple-awned Grass.

Stems 2-5 dm. tall, tufted, branching; blades 4-16 cm. long, 1-2 mm. wide; panicle 5-9 cm. long, branches erect; spikelets 10-12 mm. long; first glume much shorter than the second; second glume about equal to the lemma; lemma 7-11 mm. long; lateral awns about 3 mm. long, erect; central awn more than five times as long as the lateral awns, straight portion of central awn 5-14 mm. long.

Distribution: Missouri, Kansas and Oklahoma, also reported in Virginia. **Oklahoma:** Cleveland Co., Prier; Muskogee Co., Little; Norman, Bruner; Payne Co., Featherly; Ponca, Stevens.

Remarks: This species is found on dry, thin soil and is of but little economic importance. Fall.

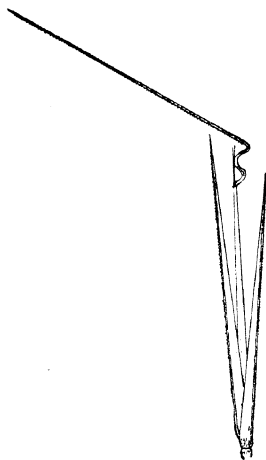


Fig. 33. *Aristida curtissii*

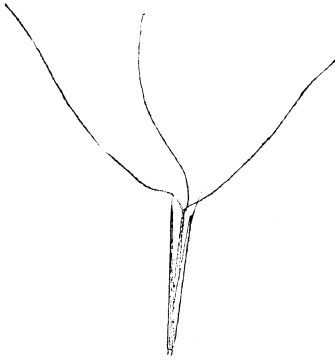


Fig. 34. *Aristida oligantha*

4. *Aristida oligantha* Michx. Few-flowered *Aristida*.

Stems 2-6 dm. tall, erect, slender, dichotomously branched; panicle 1-2 dm. long, simple, its branches short and bearing a single spikelet; spikelets 2-3 cm. long, glumes usually awned; lemma shorter than the first glume; awns spreading, central one 3.5-7 cm. long, the lateral ones a little shorter.

Distribution: New Jersey to Nebraska and southwest. **Oklahoma:** Fort Sill, English; Grant Co., Stevens; LeFlore Co., Stevens; Muskogee Co., Little; Norman, Prier; Norman, Bruner; Norman, Stemen & Myers; Ottawa Co., Stevens; Ponca, Stevens; Stillwater, Featherly; Stillwater, Stratton;

Tulsa Co., Stevens; Woods Co., Stevens; Osage Co., Penn.

Remarks: This grass is abundant on thin, clay soils. Because of its unpalatability it is grazed but little, except when young. Summer and fall.

5. *Aristida intermedia* Scribn. & Ball.

Stems 3-8 dm. tall, tufted, slender, branching; panicle 2-4 dm. long, slender, branches appressed; spikelets 8-10 mm. long; glumes awned, about equal; awns spreading, central one 15-25 mm. long, the lateral ones a little shorter.

Distribution: Iowa, Mississippi, Oklahoma and Texas. **Oklahoma:** Muskogee Co., Little; Oklahoma Co., Stemen & Myers; Ottawa Co., Stevens; Payne Co., Stevens; Osage Co., Penn.

Remarks: This is a species common in sandy soils. It is of but little economic importance. Summer and fall.

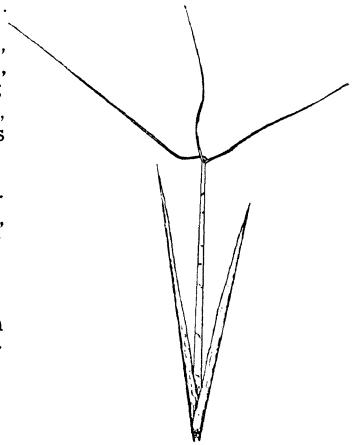


Fig. 35. *Aristida intermedia*

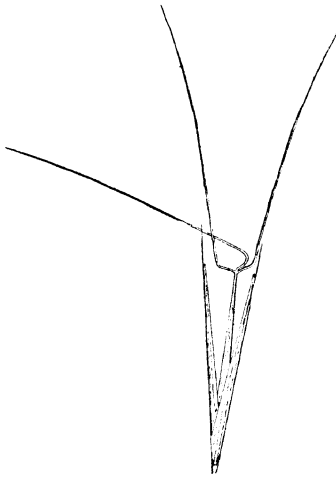


Fig. 36. *Aristida ramosissima*

6. *Aristida ramosissima* Engelm.
Branched *Aristida*.

Stems 2-4 dm. tall, tufted, slender, branched, blades 4-15 cm. long, 1-1.5 mm. wide; panicle 6-10 cm. long, branches short bearing a single spikelet; spikelets 1.6-2.2 cm. long; glumes usually awned; lemma 15-18 mm. long, central awn reflexed, 2-3 cm. long, lateral awns erect, 1-3 cm. long.

Distribution: Illinois, Missouri and Oklahoma. **Oklahoma:** Garfield Co., Pammel; LeFlore Co., Stevens.

Remarks: This species is found on dry, thin soils. It is of little or no economic importance. Summer and fall.

7. *Aristida longispica* Poir. (*A. gracilis* Ell.) Slender Triple-awned Grass.

Stems 2-4 dm. tall, erect or geniculate at base, branches at base of lower nodes, glabrous, slender; sheaths glabrous; blades flat or involute, scabrous above; glabrous below, 1 dm. long or less, 1 mm. wide; panicle narrow slender; spikes appressed; glumes about equal, scabrous on keel, about 5 mm. long, mucronate from between two short lobes; lemma 3-nerved, scabrous along keel, 4-5 mm. long; central awn sharply curved at base, horizontal, 5-15 mm. long, lateral awns erect, half as long as the central awn or less.

Distribution: New Hampshire, Illinois and Oklahoma southward. **Oklahoma:** Cleveland Co., Prier; Hominy, Featherly.

Remarks: This species is found on dry soil and is of little or no economic value. Summer and fall.

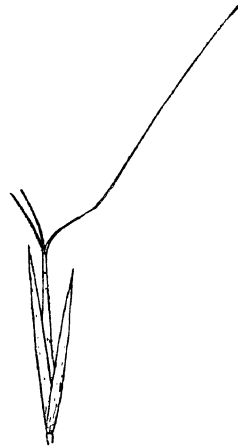


Fig. 37. *Aristida longispica*

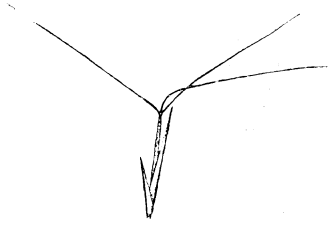


Fig. 38. *Aristida purpurea*

8. *Aristida purpurea* Nutt. Purple Aristida.

Stems 2-4.5 dm. tall, tufted, slender, leafy; panicle 1-2 dm. long, branches spreading or ascending, filiform, flexuous; spikelets 12-15 mm. long; glumes sometimes awned, first glume about half as long as the second; lemma about 1 cm. long; central awn about 3-5 cm. long, lateral awns a little shorter.

Distribution: Louisiana, Arkansas, Oklahoma, Texas and New Mexico. **Oklahoma:** Arbuckle Mountains, Featherly; Ellis Co., Clifton; Fort Sill, English; Harmon Co., Stevens; Harper Co., Stevens; Jackson Co., Stevens; Major Co., Stevens; Price's Falls, Stratton; Shattuck, Stevens; Stillwater, Featherly; Swanson Co., Stevens; Wichita Mountains, Stemen & Myers; Woods Co., Stevens.

Remarks: This species is found on dry, sandy or rocky soil. It is of little or no economic importance. Spring and summer.

9. *Aristida wrightii* Nash. Wright's Triple-awned Grass.

Stems 3.5-5 dm. tall, tufted, simple and leafy; blades involute; panicle 1-2 dm. long, branches more or less spreading and bearing 2-4 spikelets; spikelets 12-15 mm. long; first glume about half as long as the second; lemma 10-12 mm. long, a little shorter than the second glume; awns ascending, the central one 2.5-3 cm. long, the lateral ones somewhat shorter.

Distribution: Kansas to Texas and New Mexico. **Oklahoma:** Cleveland Co., Prier.

Remarks: This plant is found on dry, sandy soil. It is of no economic importance. Summer and fall.

10. *Aristida fendleriana* Steud. Fendler's Triple-awned Grass.

Stems 1.5-2.5 dm. tall, tufted, erect, rigid, simple; sheaths mostly at base of stem, a tuft of white hairs at each side of apex; blades short curly, clustered at the base of the plant; panicle 5-7 cm. long, strict branches short appressed usually bearing but one spikelet; spikelets 12-15 mm. long; first glume about half as long as the second; lemma 9-12 mm. long, awns ascending, central one 2-3.5 cm. long, lateral ones somewhat shorter.

Distribution: South Dakota to Oklahoma and Utah southward. **Oklahoma:** Guthrie, Dobson.

Remarks: This species is found on dry, sandy soil. It is of little or no economic importance. Summer and fall.

11. *Aristida lanosa* Muhl. Woolly Triple-awned Grass.

Stems 6-12 dm. tall, erect, simple, smooth and glabrous; sheaths densely woolly pubescent; blades 3-5 dm. long, 2-7 mm. wide; panicle 4-7 dm. long, its axis villose at the nodes, lower branches distant 8-12 cm. long; spikelets 12-17 mm. long; the first glume much longer than the second; lemma 8-10 mm. long; central awn diverging, 1.5-2.5 cm. long, lateral awns erect or ascending, half as long as the central one.

Distribution: Delaware to Oklahoma, Florida and Texas. **Oklahoma:** Oklahoma Co., Stemen & Myers; Murray Co., Demaree.

Remarks: This species is found in dry thickets. It is of no economic importance. Fall.

12. *Aristida purpurascens* Poir. Purplish
Aristida. Arrow-grass. Broomsedge.

Stems 3-8 dm. tall, erect usually simple, sheaths longer than the internodes; panicle 1.5-3 dm. long, branches short, appressed; spikelets 9-12 mm. long, usually crowded; first glume hispidulous, about the same length as the second; lemma 6-8 mm. long, awns more or less spreading, especially the middle one which is 1.5-2.5 cm. long, lateral awns from two-thirds as long to equaling the central one.

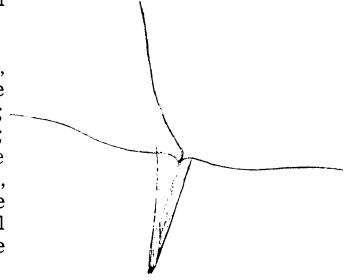


Fig. 39. *Aristida purpurascens*

Distribution: Massachusetts to Minnesota and southwest. **Oklahoma:** Stillwater, Featherly; Osage Co., Penn.

Remarks: This species is found on dry soil. It is of but little or no economic importance. Fall.

13. *Aristida divaricata* Humb. and Bonnl.

Stems erect or prostrate-spreading, 3-6 dm. long or more; sheaths longer than the internodes, glabrous with a small tuft of fine hairs on either side of the throat; leaves flat to involute; panicle large, diffuse, often half the length of the plant or more; glumes about equal, 1 cm. long; lemma 1 cm. long, twisted into a beak; awns about equal, 10-15 mm. long, divergent.

Distribution: Kansas to California south to Guatemala. **Oklahoma:** Indian Territory, Carleton; Guymon, collector unknown.

Remarks: This grass is very rare in Oklahoma.

STIPA L.

Usually tall grasses, tufted; blades usually involute; inflorescence, paniculate; spikelets 1-flowered, narrow, the glumes acute or rarely awned; lemma rigid, involute, with a hairy callus at the base and bearing a more or less persistent, bent awn which is spiral at the base.

Glumes 12-18 mm. long; lemma about 1 cm. long; awn
6-10 mm. long..... 1. *S. leucotricha*

Glumes 3-4 cm. long; lemma about 1.6-2.5 cm. long;
awn 12-20 cm. long..... 2. *S. spartea*



Fig. 40. *Stipa leucotricha*

1. *Stipa leucotricha* Trin. & Rupr. Texas Needlegrass.

Stems tufted, 3-6 dm. tall, nodes pubescent with reflexed hairs; sheaths glabrous or sparingly pubescent; blades more or less hirsute with ascending hairs, flat or involute; panicle 1-1.5 dm. long, branches erect or ascending; spikelets 15-18 mm. long exclusive of awn; lemma 1 cm. long with a white glabrous zone at the junction with the 6-8 cm. long, spiral, twice bent awn. Callus strongly white pubescent.

Distribution: Oklahoma to Texas. **Oklahoma:** Arbuckle Mts., Featherly; Fort Towson, Houghton.

Remarks: This plant is found on dry soil. It does not grow abundant enough to be of much economic value in Oklahoma. It furnishes some grazing when it is young, but toward maturity it becomes coarse and the fruit often does mechanical injury to stock by sticking in their eyes, mouths, and ears. Spring and summer.

2. *Stipa spartea* Trin. Porcupine Grass.

Stems about 1 m. tall, simple, tufted; sheaths longer than the internodes; ligule conspicuous, hyaline; blades 2-3 dm. long, 3-5 mm. wide, flat, involute when dry; panicle slender, nodding, branches few; spikelets few; glumes 3-4 cm. long, papery; lemma subcylindric 1.6-2.5 cm. long, pubescent below; crown ciliate; awn 12-20 cm. long, twisted, twice geniculate.

Distribution: Ontario to British Columbia, south to Pennsylvania, Indiana, northern Oklahoma, Kansas and New Mexico. **Oklahoma:** Kay Co., Soil Conservation Service, Com. by Kiltz.

Remarks: This is a good forage and hay crop when young. At maturity it is quite coarse and the sharp pointed fruits often do mechanical injury to the eyes, ears, nose and mouth of grazing animals. It is not abundant enough in Oklahoma to be of any economic importance.

LIMNODEA L. H. Dewey

Plants with stems more or less tufted, decumbent at the base with flat blades and slender panicles; spikelets 1-flowered with equal glumes and a 2-toothed lemma which bears a spiral awn between the teeth.

***Limnodea arkansana* (Nutt.) L. H. Dewey.**

Stems 2-4.5 dm. tall, erect or decumbent at the base; sheaths striate, hirsute on the margins; ligule conspicuous, hyaline; blades flat, erect; panicle about 1 dm. long, slender, contracted; spikelets about 4 mm. long exclusive of awn; glumes equal, as long as spikelet, somewhat hirsute; lemma about 3 mm. long, 2-toothed at apex with a bent awn 9 mm. long arising from between the teeth.

Distribution: Florida, Arkansas, Oklahoma to Texas. **Oklahoma:** Arbuckle Mts., Featherly; Fort Sill, English.

Remarks: Rare in Oklahoma. Spring.

CINNA L.

Tall perennial grasses; blades flat; inflorescence an open or contracted panicle; spikelets 1-flowered; glumes keeled, acute, lemma similar, but usually short awned on the back; palea 1-2 nerved.

Cinna arundinacea L.
 Wood Reed-grass. Sweet
 Reed-grass. Indian Reed-
 grass.

Stems 3-15 dm. tall, simple; sheaths glabrous with hyaline margins, longer than internodes; blades 1.5-3 dm. long, 4-14 mm. wide, rough; panicle 1.5-3 dm. long, branches ascending; spikelets 4-5 mm. long; glumes acute, scabrous on the keel; lemma usually bearing a short awn from the two toothed apex.

Distribution: Newfoundland to Oklahoma southward.
Oklahoma: Indian Territory, Carleton; Muskogee Co., Little; Oklahoma Co., Stemen & Myers.

Remarks: This grass is found in moist woods, where it furnishes some grazing. Summer.



Fig. 41. *Cinna arundinacea*
 (U. S. D. A. Div. Agros.)

PHLEUM L.

Annual or perennial grasses with flat blades and spike-like panicles, usually long exserted; spikelets 1-flowered; glumes equal, compressed, keeled, obliquely truncate at the top, palea narrow, hyaline.

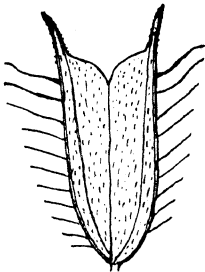


Fig. 42. *Phleum pratense*

Phleum pratense L. Timothy. Herd-grass.

Stems 3-12 dm. tall, erect, simple, arising from a swollen base; blades 1-3 dm. long, 4-6 mm. wide; spike cylindrical, dense, 3-15 cm. long, 5-8 mm. in diameter; glumes 2-5 mm. long exclusive of awn, compressed, ciliate on the keel, awn less than half the length of the glume.

Distribution: Throughout most of North America. **Oklahoma:** Norman, Prier; Stillwater, Featherly.

Remarks: This is one of the important hay crops in eastern United States and it is grown to some extent in northeastern Oklahoma. Summer.

AGROSTIS L.

Annual or perennial tufted grasses with flat or bristle-like blades and peniculate inflorescence; spikelets numerous, 1-flowered; glumes membranous, keeled, acute; lemmas obtuse, hyaline, sometimes awned on the back.

- | | |
|--|--------------------------|
| 1. Palea one-half as long as the lemma | 1. <i>A. alba</i> |
| Palea minute or wanting | 2 |
| 2. Lemmas usually awnless, rarely short awned | 3 |
| Lemmas long awned | 2. <i>A. Elliottiana</i> |
| 3. Panicle branches elongated, usually branched above the middle | 3. <i>A. hiemalis</i> |
| Panicle branches not elongated, branched at or below the middle | 4. <i>A. perennans</i> |

1. Agrostis alba L. White Bent-grass. Redtop. Fiorin. White-top. White, Marsh or Creeping Bent-grass. Black Quick-grass.

Stems 2-8 dm. tall, slender, simple, smooth, erect or geniculate at base; sheaths smooth shorter than internodes; blades flat, rough on each side; panicle 1-2 dm. long, branches spreading or ascending; spikelets 2-2.5 mm. long; glumes equal, 1-nerved, hispidulous on the keel.

Distribution: Throughout most of the United States and parts of Canada. **Oklahoma:** Caddo Co., Stevens; Hinton, Stevens; Muskogee Co., Little; Norman, Prier; Oklahoma Co., Stemen & Myers.

Remarks: This species is found in fields and meadows especially on sour soil. It makes fair hay after it is thrashed. The seeds are unpalatable to livestock. Summer.

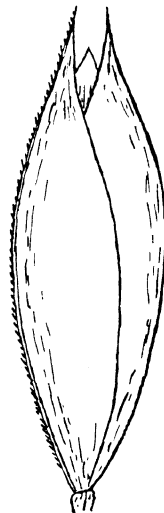


Fig. 43. *Agrostis alba*



Fig. 44. *Agrostis eliottiana*

2. *Agrostis eliottiana* Schult. Elliott's Bent-grass. Spider Bent-grass.

Annual; stems 1-4 dm. tall, slender, erect, branched below; sheaths loose, shorter than the internodes; blades narrow, short, rough; panicle 5-12 cm. long, open, branches filiform; spikelets about 1.5 mm. long; glumes equal; lemma erose-truncate bearing a delicate, filiform, fluxuous, barbellate, awn, inserted below the apex.

Distribution: South Carolina to Kansas southward. **Oklahoma:** Cleveland Co., Prier; Fort Sill, English; Stillwater, Stratton.

Remarks: This species is usually quite abundant on dry prairie soil, but it is so delicate that it is of practically no economic value. Spring and summer.

3. *Agrostis hiemalis* (Walt.) B. S. P. Rough Hair-grass. Fool-hay. Silk-grass. Fly-away-grass.

Stems 3-8 dm. long, tufted, slender, smooth; sheaths smooth, shorter than the internodes; blades slender, more or less rough, panicle 1.5-6 dm. long open; spikelets about 2 mm. long borne on the ends of branches; glumes subequal, hispidulous on the keel; lemma about as long as the first glume; palea very small.

Distribution: Throughout most of the United States. **Oklahoma:** Cleveland Co., Prier; Fort Sill, English; Muskogee Co., Little; Norman, Prier; Norman, Van Vleet; Pawhuska, Stevens; Wichita Mts., Stemen & Myers.

Remarks: This species is found quite generally distributed throughout the United States. It furnishes but little grazing. Summer.

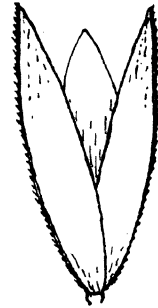


Fig. 45. *Agrostis hiemalis*

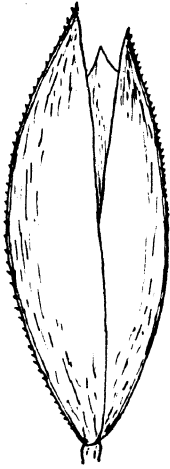


Fig. 46. *Agrostis perennans*

4. *Agrostis perennans* (Walt.) Tuckerm.
Upland Bent-grass.

Stems 3-8 dm. tall, slender, smooth; sheaths smooth, overlapping; blades slender, rough; panicle 1-2 dm. long, open, branches slender; spikelets about 2 mm. long; glumes subequal, scarious on the keel; lemma shorter than the first glume, smooth; palea small or wanting.

Distribution: Massachusetts, Missouri, Oklahoma and Tennessee. **Oklahoma:** Alfalfa Co., Stevens; Cleveland Co., Prier; Greer Co., Bull.

Remarks: This species is of little economic importance. Summer and fall.

BRACHYELYTRUM Beauv.

Tall perennial grass with flat blades and narrow terminal panicles with erect filiform branches; spikelets narrow, 1-flowered, rachilla produced beyond the flower and sometimes bearing a minute scale; glumes small, the first very minute or almost wanting; lemma long, rigid, 5-nerved, acuminate, long awned; palea somewhat shorter, rigid, 2-nerved.

***Brachyelytrum erectum* (Schreb.) Beauv.**
Bearded Short-husk.

Stems 3-9 dm. tall, slender, simple, pubescent around the nodes; sheaths shorter than the internodes, villous about the throat; blades 5-14 cm. long, 6-18 mm. wide; panicle 5-15 cm. long, slender, branches erect or appressed; glumes unequal, the lower one minute or wanting; lemma 9-12 mm. long exclusive of awn; awn erect 2-2.5 cm. long.

Distribution: Newfoundland, Ontario and Minnesota southward to Oklahoma and Georgia. **Oklahoma:** LeFlore Co., Stevens; McCurtain Co., Little & Olmsted.

Remarks: This plant is found in moist woodlands. It is of but very little economic importance.



Fig. 47. *Brachyelytrum erectum*

MUHLENBERGIA Schreb.

Perennial (rarely annual) grasses with scaly rootstocks; inflorescence a panicle, diffuse or spike-like; spikelets 1-flowered, rarely 2-flowered;

glumes membranous or hyaline, acute, often unequal, mucronate, sometimes awned; lemma 3-5 nerved, firm, obtuse or acute, often produced into a capillary awn; palea 2-keeled

1. Creeping rootstocks present or decumbent stems rooting at the nodes 2
 Creeping rootstocks absent; stems usually erect 7
2. Rootstocks absent; decumbent stems rooting at nodes; Glumes minute, first often absent 1. *M. schreberi*
 Rootstocks usually conspicuous, scaly, creeping 3
3. Panicle open; spikelets on slender pedicels 2. *M. asperifolia*
 Panicle narrow, more or less closed; spikelets on short pedicels 4
4. Panicles loosely flowered, slender; glumes broad below, abruptly pointed 5
 Panicles densely flowered; glumes tapering from base to apex 6
5. Spikelets 1.5-2.5 mm. long; lemma awnless or awn-tipped 3. *M. sobolifera*
 Spikelets 3-4 mm. long; lemma tapering to an awn 3-10 mm. long 4. *M. tenuiflora*
6. Glumes stiff awn-tipped, exceeding the lemma 5. *M. racemosa*
 Glumes acuminate awn-tipped but not stiff or exceeding the lemma 6. *M. mexicana*
7. Panicle narrow or spikelike; branches spikelet bearing from the base or nearly so; lemmas mucronate or short awned 7. *M. cuspidata*
 Panicle open, or at least, branches naked at the base 8
8. Blades short in a basal cluster, involute 9
 Blades elongate, flat or involute 10
9. Panicle usually less than 15 cm. long; blades 1 to 3 cm. long, curled 8. *M. torreyi*
 Panicle usually more than 20 cm. long; blades 5-8 cm. long 9. *M. arenicola*
10. Panicle usually not more than twice as long as broad; lemma with awn 2 to 5 mm. long 10. *M. reverchoni*
 Panicle at least 4 times as long as wide; lemmas with awn 5-15 mm. long 11. *M. capillaris*

1. Muhlenbergia schreberi Gamel. (*M. diffuso* Willd.) Nimble Will. Drop-seed-grass. Wire-grass. Satin-grass.

Stems 3-9 dm. long, decumbent, prostrate or creeping, slender much branched grass; sheaths loose, shorter than the internodes; ligule short, fringed; blades 4-9 cm. long, 1-4 mm. wide; panicle 5-20 cm. long, slender, its branches 2-5 cm. long, erect; glumes of spikelet minute, unequal, the lower sometimes wanting; lemma 2 mm. long exclusive of awn; scabrous on the nerves; awn 1-4 mm. long.

Distribution: Maine to Minnesota southward to Florida and Texas. **Oklahoma:** Cleveland Co., Prier; Pryor, Hildebrand; Osage Co., Penn.

Remarks: This species is found on dry soils in woods and waste places. It is of no economic importance. Summer.

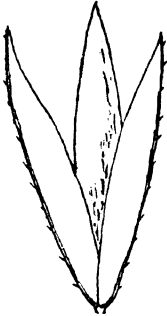


Fig. 48. *Muhlenbergia asperifolia*

2. *Muhlenbergia asperifolia* (Nees & Mey.) Parodi. Scratchgrass.
Stem 1-4 dm. long, decumbent and much branched at the base; sheaths short, overlapping; blades short, slender and erect; panicle 1-2 dm. tall, included at base, branches ascending; spikelets 1-2 mm. long, 1-3 flowered.

Distribution: Saskatchewan to British Columbia south to Missouri and Mexico. **Oklahoma:** Harmon Co., Stevens; Woods Co., Stevens.

Remarks: This is a grass of dry regions. It furnishes some grazing but as it reaches maturity the blades become coarse and more or less unpalatable.

3. *Muhlenbergia sobolifera* (Muhl.) Trin.
Rock Drop-seed.

Stems 3-9 dm. tall, ascending slender, simple or sparingly branched above; stems from creeping rootstocks; sheaths longer than the internodes; ligule a ciliate ring; blades rough, 1-1.5 dm. long, 2-6 mm. wide; those on branches 2-8 cm. long, 2 mm. wide; panicle 7-15 cm. long, narrow; glumes about 1-2 mm. long, acute scabrous on the keel; lemma scabrous, obtuse, 3-nerved, middle nerve usually forming a short point.



Fig. 49. *Muhlenbergia sobolifera*

Distribution: New Hampshire to Minnesota and Oklahoma southward. **Oklahoma:** Fort Sill, English; Muskogee Co., Little; Norman, Prier; Ottawa, Stevens; Osage Co., Penn.

Remarks: This species is usually found in rocky woodlands. It is of no economic importance. Summer and fall.

4. *Muhlenbergia tenuiflora* (Willd.) B. S. P.

Stems erect, solitary or few in tuft, 5-8 dm. tall, retrorsely pubescent at least around the nodes, sparingly branched; blades 6-10 mm. wide and about 10-18 cm. long; panicles slender, 5-15 cm. long; spikelets 3-4 mm. long; glumes about half as long as the spikelet; lemma with an awn 3-10 mm. long.

Distribution: Iowa, Ontario to Vermont, south to Virginia, Tennessee and Oklahoma. **Oklahoma:** LeFlore Co., Little & Olmsted.

Remarks: Found in rocky wooded ground. It is of little importance.



Fig. 50. *Muhlenbergia racemosa*

5. *Muhlenbergia racemosa* (Michx.) B. S. P. Wild Timothy. Satin-grass.

Stems 3-9 dm. tall, erect or ascending, much branched; blades 5-13 cm. long, 2-6 mm. wide, rough; panicle 5-12 cm. long, dense, interrupted, branches erect or appressed; spikelets crowded; glumes acuminate, 4-6 mm. long including awn; lemma 2.5-3.5 mm. long, mucronate, 3-nerved; palea ovate, lanceolate, somewhat shorter than the lemma.

Distribution: Newfoundland to British Columbia, south to New Jersey, Maryland, Oklahoma and New Mexico. **Oklahoma:** Perkins, Featherly; Wichita Mts., Stemen & Myers; Osage Co., Penn.

Remarks: This is a grass of moist soil. It forms some grazing and it is a good soil binder. Summer and fall.

6. *Muhlenbergia mexicana* (L.) Trin. Mexican Drop-seed. Satin-grass. Wood-grass.

Stems 6-12 dm. long, ascending decumbent or prostrate, much branched, smooth; sheaths shorter than the internodes except at the ends of the branches where they are overlapping; blades rough, 1-1.5 dm. long, 2-6 mm. wide; those of the branches smaller; panicle 5-15 cm. long, contracted; spikelets 2.5-3 mm. long, glumes unequal, acuminate or short awned, rough on the keel; lemma acuminate, rough.

Distribution: New England to Wyoming and southward. **Oklahoma:** Bristow, Prall; Norman, Prier; Oklahoma Co., Stemen & Myers; Ottawa Co., Stevens; Perkins, Featherly; Stillwater, Featherly; Osage Co., Penn.

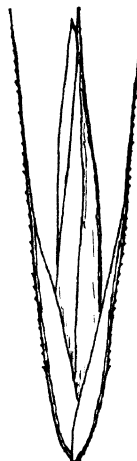


Fig. 51. *Muhlenbergia mexicana*

Remarks: This species is found in lowlands and moist places. It furnishes some grazing, and it is a good soil binder. Summer and fall.



Fig. 52. *Muhlenbergia cuspidata*

7. *Muhlenbergia cuspidata* (Torr.) Nash.
Prairie Rush-grass.

Stems 3-6 dm. tall, smooth, erect, branched; sheaths shorter than the internodes; blades 3-10 cm. long, 1-2 mm. wide, erect; panicle 4-12 cm. long, slender, its branches appressed; spikelets 2.5-3 mm. long; glumes about half as long as the lemma; lemma long acuminate, cuspidate.

Distribution: Manitoba to Alberta, south to Missouri and Oklahoma. **Oklahoma:** Osage Co., Stevens; Pawhuska, Featherly; Osage Co., Penn.

Remarks: This species is found on dry soils. It is of no economic importance. Summer and fall.

11. *Muhlenbergia capillaris* (Lam.) Trin.
Long-awned Hair-grass.

Stems tufted, 5-12 dm. tall, simple, smooth or nearly so; ligule 3-4 mm. long; blades 15-20 cm. long; sharp pointed, 1-3 mm. wide; panicle 1.5-4 dm. long, loose, erect, open, often included at the base, often purple, branches very slender, long, stiff or flexuous; spikelets single, on long hair-like pedicels 1-3 cm. long, 3.5-4 mm. long exclusive of awns; glumes half as long as spikelets or less; lemmas with awn 6-15 mm. long; palea as long as lemma, sometimes awned.

Distribution: Massachusetts to Kansas, south to Florida and Texas. **Oklahoma:** Arbuckle Mts., Featherly; Skiatook, Featherly; Stillwater, Featherly; Osage Co., Penn.

Remarks: This species is found on dry, rocky soils. It is of no economic importance. Fall.



Fig. 53. *Muhlenbergia capillaris*

8. Muhlenbergia torreyi (Kunth.) Hitchc.
Ring grass. Pancake grass.

Stems 1-4 dm. tall, glabrous, erect, simple, rigid from a slender creeping rootstock; ligule 3 mm. long; blades 2.5 cm. long, 3 mm. wide, basal leaves numerous, usually recurved; panicle from 5-15 cm. long, slender, often purple, branches filiform, spreading; spikelets on pedicels 4-10 mm. long; glumes unequal, short awned or awn-pointed; lemma 3 mm. long 2-toothed and 3-nerved, awn about 3 mm. long, palea 2-toothed.

Distribution: Kansas to Colorado south to Texas and Arizona. **Oklahoma:** Mountain Park, Stevens.

Remarks: This species is found on dry soils. It is a poor grazing grass due to the fact that is easily pulled up in grazing. Fall.

9. Muhlenbergia arenicola Buckl.

Quite similar to *M. torreyi* but a larger plant. Stems 3-5 dm. tall; panicle usually about 20 cm. long; blades 5-8 cm. long and usually straight.

Distribution: Western Kansas and Oklahoma to Arizona, south to Mexico. **Oklahoma** Mountain Park, Stevens.

10. Muhlenbergia reverchoni Vasey & Scribn.

Resembles *M. capillaris*. denser tufts, old basal sheaths forming a curly fibrous mass; stems slender; glumes less than half as long as the lemma, subacute or erose; lemma with awn 2 to 5 mm. long.

Distribution: Oklahoma and Texas. **Oklahoma:** Arbuckle Mts., Kiltz; Murray Co., Hopkins.

Remarks: Dry rocky prairies.

CALAMOVILFA Hack.

Tall perennial grasses with stout horizontal rootstocks and long narrow blades which are involute at the end; inflorescence a panicle; spikelets 1-flowered, rachilla not prolonged beyond the flower; glumes unequal; lemma subtended by a ring of hairs; palea 2-keeled.



Fig. 54. *Muhlenbergia torreyi*

Calamovilfa gigantea (Nutt.) Scribn.
Big Sand-grass. Carrizzo.

Stems 6-15 dm. tall, stout, glabrous, simple; sheaths longer than internodes; blades involute toward the tip; panicle 2-6 dm. long, branches erect or ascending; spikelets 6-7 mm. long; glumes unequal, the second equal or longer than the floret, the first shorter; callus hairs half the length of the floret.

Distribution: Western Ontario to Mackenzie southward to Oklahoma. **Oklahoma:** Alva, Stevens; Ellis Co., Stevens.

Remarks: This is a coarse grass found on sandy soils. It has some value as a soil binder. Summer and fall.

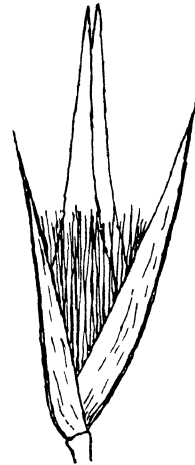


Fig. 55. *Calamovilfa gigantea*

SPOROBOLUS R. Br.

Perennial or sometimes annual grasses with flat or involute blades and open or closed panicles which are often included at the base; spikelets usually small, 1-flowered, sometimes 2-3 flowered; first glume somewhat shorter than the second; lemma equal or longer than the second glume; palea 2-nerved.

1. Plants with creeping rootstocks	2
Plants without creeping rootstocks	3
2. Panicle contracted	1. <i>S. macrus</i>
Panicle open, branches spreading	2. <i>S. texanus</i>
3. Annuals	4
Perennials	5
4. Spikelets 4 mm. long; lemma pubescent	3. <i>S. vaginaeflorus</i>
Spikelets 3 mm. long; lemma glabrous	4. <i>S. neglectus</i>
5. Panicle contracted	6
Panicle open (sometimes contracted in <i>S. cryptandrus</i>)	7
6. Lemma pubescent; palea acuminate, exceeding lemma	5. <i>S. clandestinus</i>
Lemma glabrous; palea not exceeding lemma	6. <i>S. asper</i>
7. Spikelets 4-6 mm. long; first glume subulate	7. <i>S. heterolepis</i>
Spikelets 2-3 mm. long; glumes ovate to lanceolate	8
8. Panicle branches verticillate; spikelets 1.5 mm. long	8. <i>S. argutus</i>
Panicle branches alternate	9
9. Sheaths naked or sparingly ciliate at the throat	9. <i>S. airoides</i>
Sheaths densely pilose at the throat	10. <i>S. cryptandrus</i>



Fig. 56. *Sporobolus macrus*

1. *Sporobolus macrus* (Trin.) Hitchc.

Stems 4-7 dm. tall, erect, simple, smooth, with numerous scaly rootstocks; sheaths smooth, the lower ones overlapping, a tuft of hairs on each side at the throat; blades 1-3 dm. long, erect or ascending, rough above, involute toward tip; panicle narrow, 5-15 cm. long, spike-like, more or less interrupted, included at the base; spikelet 4-4.5 mm. long, greenish purple; glumes unequal, first about half as long as second, the second about two-thirds as long as the lemma.

Distribution: Oklahoma, Louisiana and Missouri. **Oklahoma:** Osage Co., Featherly; Osage Co., Penn.

Remarks: This species is not abundant enough to be of any economic importance. Fall.

2. *Sporobolus texanus* Vasey. Texas
Drop-seed.

Stems 3-6 dm. tall, more or less tufted, branching below; sheaths overlapping; blades erect scabrous above; panicle spreading included at the base; spikelets 2-2.5 mm. long; first glume half as long as the second or less; lemma about 2.5 mm. long.

Distribution: Kansas to Oklahoma and Mexico. **Oklahoma:** Cherokee, Stevens; Jackson Co., Hopkins.

Remarks: This species is found on dry prairie soils. It is not abundant enough in Oklahoma to be of any importance. Summer and fall.

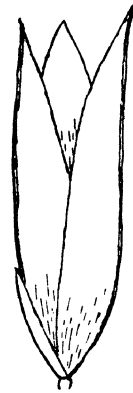


Fig. 57. *Sporobolus texanus*

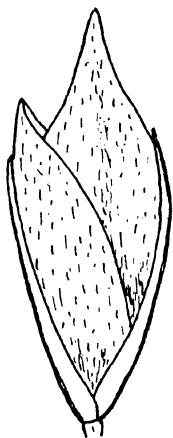


Fig. 58. *Sporobolus vaginaeflorus*

3. *Sporobolus vaginaeflorus* (Torr.) Wood.

Stems 2-7 dm. tall, slender; upper sheaths inflated and including panicles; blades 1-2 dm. long, involute toward the tip; panicle narrow, 2-5 cm. long, mostly included; spikelets 3.5-4.5 mm. long; lower glume shorter; lemma appressed pubescent.

Distribution: Maine to South Dakota southward to Georgia and Texas. **Oklahoma:** Burbank, Featherly; Norman, Prier; Oklahoma Co., Stemen & Myers; Sapulpa, Bush; Stillwater, Featherly; Osage Co., Penn.

Remarks: This species is found on dry soils. It furnishes some grazing while it is young, but as it reaches maturity it becomes unpalatable. Summer and fall.

4. *Sporobolus neglectus* Nash. Small Rush-grass.

Stems 1.5-4 dm. tall, slender, tufted, branching, erect or decumbent at base; sheaths shorter than internodes; usually inflated and including slender panicles; blades erect, attenuate involute; panicles narrow; included or partly included in the upper sheath; spikelets 2.5-3 mm. long; first glume slightly shorter than second; lemma a little longer than second glume.

Distribution: New Brunswick to North Dakota, south to Virginia, Missouri and Oklahoma. **Oklahoma:** Oklahoma Co., Stemen & Myers; Osage Co., Featherly; Payne Co., Featherly; Osage Co., Penn.

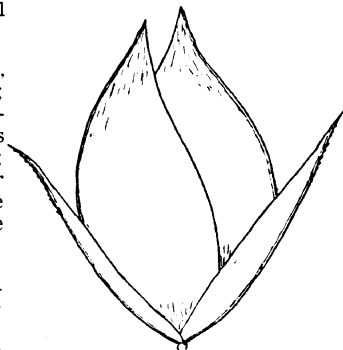


Fig. 59. *Sporobolus neglectus*

Remarks: This plant is found on thin, dry soil. It is of but little economic importance. Summer and fall.

5. *Sporobolus clandestinus* (Spreng.) Hitchc. Rough Rush-grass.

Stems 3-12 dm. tall, erect, slender; basal sheaths overlapping the upper ones, inflated; lower blades long, narrow attenuate; panicle 4-10 cm. long, branches appressed, short exerted; spikelets 6-7 mm. long, usually purple; glumes unequal, lemma pubescent below; palea much longer than the lemma.

Distribution: Connecticut to Oklahoma southward to Florida and Texas. **Oklahoma:** Stillwater, Featherly; Osage Co., Penn.

Remarks: This plant is found on dry, thin soils. It is not abundant enough to be of any economic importance to Oklahoma. Summer and fall.



Fig. 60. *Sporobolus clandestinus*

6. *Sporobolus asper* (Michx.) Kunth.

Stems 5-12 dm. tall, erect, glabrous; sheaths overlapping; blades 1-6 dm. long with involute filiform tips; panicles 5-15 cm. long included at base or almost entirely included, branches appressed; spikelets 4-6 mm. long, first glume about half as long as second; lemma glabrous, somewhat longer than palea.

Distribution: Maine to South Dakota, south to Texas. **Oklahoma:** Hydro, Scott; Norman, Prier; Oklahoma Co., Stemen & Myers; Sapulpa, Bush; Stillwater, Featherly; Osage Co., Penn; Pushmataha Co., Barclay.

Remarks: This species is found on dry soils. It is one of the constituents of wild prairie hay. Summer and fall.



Fig. 61. *Sporobolus asper*



Fig. 62. *Sporobolus asper*
var. *hookeri*

6a. *Sporobolus asper* var. *hookeri* (Trin.)
Vasey. (*S. drummondii* Vasey.)

Stems more slender; leaves often long slender and filiform toward the tip; panicle fewer-flowered; spikelets 3-5 mm. long.

Distribution: From Missouri and Oklahoma south to Mississippi and Texas. **Oklahoma:** Payne Co., Featherly; Norman, Prier; Norman, Bruner; 101 Ranch, Featherly; Osage Co., Penn.

7. *Sporobolus heterolepis* A. Gray. North-
ern Drop-seed. Bunch-grass.

Stems 3-10 dm. tall, erect tufted; sheaths longer than the internodes; blades mostly basal, slender, erect, 2.5 dm. long or less; panicle 1-2.5 dm. long, branches erect or ascending; spikelets 5-6 mm. long; glumes unequal, first half as long as second which is usually awn pointed; lemma shorter than second glume.

Distribution: Quebec to Saskatchewan, south to Texas. **Oklahoma:** Barnsdall, Featherly; Oklahoma Co., Stemen & Myers; Osage Co., Penn.

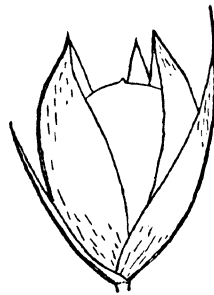


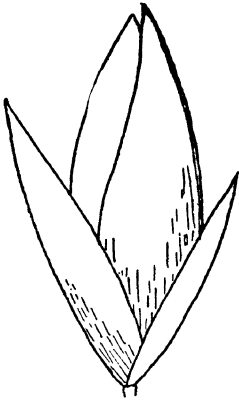
Fig. 63. *Sporobolus heterolepis*

Remarks: This species is found on dry or moderately moist soil. It is not abundant enough to be of any economic importance. Summer and fall.

8. *Sporobolus argutus* (Nees.) Kunth. Pointed Drop-seed.

Stems 1-5 dm. tall, erect or decumbent at base; sheaths shorter than internodes; blades flat 2 dm. long or less, 2-6 mm. wide; panicle 5-13 cm. long, branches in half whorls or approximately so, ascending or spreading; spikelets about 1.5 mm. long, usually lead colored; first glume about one-fourth the length of the second.

Distribution: Kansas to Colorado south to Texas and Mexico. **Oklahoma:** Fort Sill, English; Norman, Prier.

Fig. 64. *Sporobolus airoides*

9. *Sporobolus airoides* (Torr.) Torr. Alkali Sacaton. Salt-grass.

Stems 4-9 dm. tall, erect or decumbent at the base; blades 1-2 dm. long, slender, involute; panicle 1.5-4 dm. long, branches spreading or ascending, often included at the base; spikelets 2 mm. long; glumes without nerves, first glume about half as long as the second.

Distribution: Nebraska to Texas, Montana and California. **Oklahoma:** Alfalfa Co., Stevens; Cleveland Co., Prier; Fort Sill, English; Guthrie, Dobson; Hollis, Stevens; Woods Co., Stevens.

Remarks: This species is found on dry to moderately moist prairie soils. It is one of the constituents of wild prairie hay. Summer and fall.

10. *Sporobolus cryptandrus* (Torr.) A. Gray. Sand Drop-seed. Prairie-grass.

Stems 4-10 dm. tall, erect, sometimes branched below; sheaths with a dense tuft of hairs on each side of the throat; blades flat; panicle 1.5-3 dm. long, included at base, branches spreading or ascending; spikelets about 2 mm. long; first glume about one-third as long as second; lemmas about as long as second glume.

Distribution: Massachusetts to Montana, south to Missouri and Texas. **Oklahoma:** Fort Sill, English; Frederick, Snow; Martha, Crosby; Norman, Prier; Oklahoma Co., Stemen & Myers; Stillwater, Stratton; Stillwater, Featherly; Woods Co., Stevens; El Reno, Childers; Rocky, McCannon; Osage Co., Penn.

Remarks: This species is found on sandy soil. It furnishes some grazing. Summer and fall.

Fig. 67. *Sphenopholis obtusata*

HOLCUS L.

Spikelets 2-flowered, articulation below the glumes, rachilla curved below the first floret; glumes about equal and longer than the two florets; first floret lemma awnless; second floret staminate, lemma bearing a short dorsal awn.

Holcus lanatus L. Velvet-grass.

Grayish and densely pubescent; stems 3-9 dm. tall; blades 4-8 mm. wide, 2.5-15 cm. long; panicle 8-15 cm. long, contracted, purple-tinged; spikelets 4 mm. long; glumes villous, hirsute on the nerves; lemmas smooth, awn of the second hook-like.

Distribution: Found throughout most of the United States and British Columbia. **Oklahoma:** Tahlequah, Parrott.

Remarks: Introduced from Europe and sometimes cultivated as a meadow grass.

TRISETUM Pers.

Annual or perennial grasses with closed or open panicles; spikelets 2-4 flowered; rachilla extending beyond the uppermost floret; glumes unequal; lemma 2-toothed with dorsal awn.



Fig. 66. *Trisetum interruptum*

Trisetum interruptum Buckl.

Stems tufted, 1-4 dm. tall, sheaths with conspicuous ligule; blades flat, 5 cm. long or less; panicle spike-like, 4-10 cm. long, included at the base; spikelets 2-3 flowered, 4-5 mm. long exclusive of awns; glumes about 4 mm. long, first 3-nerved, second 5-nerved; lemma 4-5 mm. long bearing a dorsal bent awn.

Distribution: Oklahoma and Texas. **Oklahoma:** Ripley, Featherly.

Remarks: This plant is found on dry soil. It is of no economic importance. **Spring.**

SPHENOPHOLIS Scribn.

Perennial grasses; variable sheaths and flat blades; panicles narrow; spikelets 2-flowered, the rachilla extending beyond upper floret; the lower glume linear, 1-nerved, the second broad 3-nerved, rounded or acute at the apex; lemma longer than glumes.

Second glume almost as long as broad, obtuse or truncate ----- 1. *S. obtusata*
 Second glume much longer than broad, obtuse or acute -- 2. *S. intermedia*

1. *Sphenopholis obtusata* (Michx.) Scribn.
 Blunt-scaled sphenopholis. Early Bunchgrass.

Stems 3-8 dm. tall, tufted, erect, simple; sheaths variable in length; blades flat, 1-3 dm. long; panicle narrow, exserted 5-15 cm. long; spikelet 2-3 mm. long; first glume linear, second glume about as broad as long, obtuse or truncate at apex; lemma narrow obtuse.



Distribution: Maine to Saskatchewan, south to Florida, Oklahoma and Arizona. Fig. 67. *Sphenopholis obtusata*

Oklahoma: Alva, Stevens; Fort Sill, English; Major Co., Stevens; Muskogee Co., Little; Norman, Prier; Norman, Jeffs; Norman, Van Vleet; Stillwater, Stratton; Watonga, Graff; Wichita Mts., Featherly; Woods Co., Stevens; Osage Co., Penn.

Remarks: This species is found on a variety of soils. It is quite widely distributed but is seldom abundant enough in any locality to be of any considerable importance. Summer.



Fig. 68. *Sphenopholis intermedia*

2. ***Sphenopholis intermedia*** (Rydb.) Rydb.
S. pallens (Spreng.) Scribn. of most manuals covering Oklahoma.

Stems 3-8 dm. tall, tufted, simple, erect; blades 5-15 cm. long, rough; panicle 8-20 cm. long, narrow, sometimes nodding, spikelets about 3 mm. long; lower glume linear, second glume obtuse or acute, not as broad as long; lemma 2-2.5 mm. long.

Distribution: Newfoundland to British Columbia, south to Georgia and Texas. **Oklahoma:** Muskogee Co., Little; Norman, Prier; Norman, Bruner.

Remarks: This species grows in a variety of soils. It is not abundant enough in Oklahoma to be of any value. Summer.

KOELERIA Pers.

Tufted annual or perennial grasses with spike-like panicles; spikelets 2-5 flowered, rachilla produced beyond the perfect floret sometimes bearing a sterile floret; glumes unequal, keeled; lemma 3-5 nerved, palea hyaline.

Koeleria cristata (L.) Pers. Koeler's grass. Prairie June-grass.

Stems 3-6 dm. tall, erect, pubescent at nodes and below panicle; blades 5-25 cm. long, erect, flat or involute toward tip; panicle 5-20 cm. long, spike-like; spikelets 2-5 flowered, 4-6 mm. long, glumes unequal, scabrous on veins; lemma 3-4 mm. long.

Distribution: Ontario to British Columbia, south to Pennsylvania, Texas and California. **Oklahoma:** Kay Co., Featherly; Muskogee Co., Little; Norman, Prier; Oklahoma Co., Stemen & Myers; Osage Co., Penn.

Remarks: This is a bunch grass and although it is quite common in some parts of Oklahoma it is not abundant enough to be of importance by itself, but it is grazed and it forms one of the fillers in prairie vegetation. Summer.

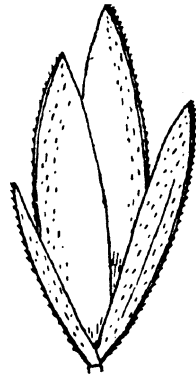


Fig. 69. *Koeleria cristata*

DANTHONIA Lam. and DC.

Usually perennial grasses with flat or involute blades; panicles open or spike-like; spikelets large; glumes large, equal, papery; usually longer than the last flower; lemmas bifid at the apex with a twisted geniculate awn extending from between the teeth.

Danthonia spicata (L.) Beauv. Wild Oat-grass.

Stems 2-10 dm. long, slender, erect, or longer ones leaning; sheaths pubescent; blades slender, involute, lower ones curly; panicles 2.5-7 cm. long, branches appressed; spikelets 5-8 flowered; glumes about 10 mm. long, thin and papery; lemmas 4.5 mm. long, bifid with a twisted, geniculate awn 5-8 mm. long extending from between the teeth.

Distribution: Newfoundland to South Dakota southward to Texas. **Oklahoma:** Okmulgee, Carleton.

Remarks: This plant is found in dry, open woods. It is not grazed by livestock unless food is scarce. Summer and fall.

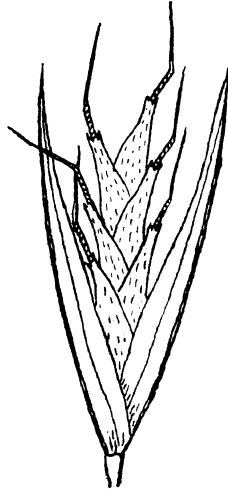


Fig. 70. *Danthonia spicata*

DESCHAMPSIA Beauv.

Annuals or perennials with paniculate inflorescence; spikelets 2-flowered; disarticulating above the glumes and between the florets; rachilla hairy and extending beyond the upper floret as a sterile pedicel or sometimes with a reduced floret; glumes about equal, membranaceous; lemma thin, 2-4 toothed, awned from below the middle.

Deschampsia flexuosa (L.) Trin. Crinkled Hair-grass.

Stems simple, tufted, erect or curved at base, 3-8 dm. tall; basal sheaths papery, ligule conspicuous, hyaline; blades involute, filiform, flexuous; panicle, 5-15 cm. long, more or less diffuse, branches flexuous, naked toward the base; spikelets 4-5 mm. long, often purplish; glumes 1-nerved, shorter than the spikelet; lemma, toothed at apex, twisted, geniculate awn attached near base.

Distribution: Greenland and Alaska, southward to North Carolina and Oklahoma. **Oklahoma:** LeFlore Co., Little & Olmsted.

AVENA L.

Annual grasses with a closed or open panicle, usually with large spikelets; spikelets 2-flowered, rachilla bearded, articulating above the glumes and usually between the florets; glumes subequal, papery, longer than the lower floret; lemma 2-toothed at the apex, usually bearing a dorsal awn.

Upper grain persistent to the rachilla 1. *A. sterilis*
 Upper grain easily disarticulating from rachilla 2. *A. sativa*

1. *Avena sterilis* L. Red Oat. Animated Oat.

Stems 5-10 dm. tall; leaves slender; panicles symmetrical; glumes about 5 cm. long, basal hairs usually present; the first grain easily articulate leaving a large scar; the second grain very persistent with no articulation point.

Remarks: This is the Red Oat which is cultivated for grain and forage.

2. *Avena sativa* L. Oats.

Annuals, stems 5-15 dm. tall; blades flat, 1-3 dm. long, 4-10 mm. wide; panicle loose, pyramidal, branches erect or ascending; spikelets 2-3 flowered, drooping; glumes 2-2.5 cm. long, 9-11 nerved; lemma 7-nerved, 2 cm. long, awn short or none.

Remarks: This plant is the common oat. It is cultivated as a cereal crop and is an escape in waste places and roadsides.

ARUNDO L.

Spikelets several flowered, the florets varying in length until the summits are about equal height; rachilla glabrous, articulating above the glumes and between the florets; glumes membranaceous, subequal; lemmas silky-long-pilose, nerves ending in teeth with the mid-nerve extending into a straight awn.

Arundo donax L. Giant Reed.

Stems stout from stout rhizomes, 2 to 6 m. tall; blades numerous, 5 to 7 cm. wide, conspicuously distichous and evenly distributed along the stem; panicles dense, 30 to 60 cm. long, erect; spikelets about 12 mm. long.

Distribution: Oklahoma and Texas to California and tropical America.
Oklahoma: Stillwater, Featherly.

Remarks: In the Southwest the stems are used for lattices, mats, screens and in the construction of adobe huts.

PHRAGMITES Trin.

Tall perennial grasses with plume-like panicles; spikelets many flowered, the first staminate or neuter; rachilla covered with long silky hairs, articulate above the glumes and between the florets; lemmas long.

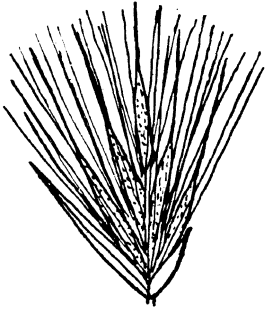


Fig. 71. *Phragmites communis*

Phragmites communis Trin. Common Reed-grass. Pole, Bog, or Dutch-reed.

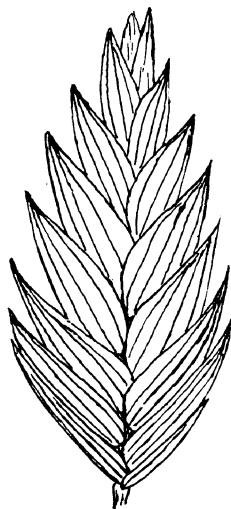
Stems 1.5-4 m. tall, stout, erect, from rootstocks; sheaths overlapping; blades 1.5-3 dm. long; panicle 1.5-3.5 dm. long; spikelets 14-18 mm. long with silky hairs as long as the spikelet; glumes unequal, first shorter, second glume about half as long as first lemma.

Distribution: Most of North America north of Mexico. **Oklahoma:** Beaver Co., Stevens; Norman, Prier & Hefley; Ripley, Featherly.

Remarks: This plant is of little value as a grazing grass but it has possibilities as an ornamental grass. Summer and fall.

DISTICHLIS Raf.

Perennial dioecious grasses with creeping, scaly rootstocks; stems rigid, erect or decumbent at the base; blades flat or involute; panicle short, dense, spike-like; spikelets flattened, many flowered; glumes narrow, keeled, acute; lemmas closely imbricated.

Fig. 72. *Distichlis stricta*

Distichlis stricta (Torr.) Rydb. Marsh-spike-grass. Alkali-grass. Salt-grass.

Stems 1-6 dm. tall, rigid; branches leafy, from a wiry rootstock; sheaths overlapping; blades 5-10 cm. long, flat or involute; panicle short, dense, spike-like; spikelets 8-18 mm. long, 6-16 flowered, pistillate and staminate spikelets quite similar in appearance; glumes unequal; lemmas of pistillate spikelets 5-6 mm. long, those of staminate spikelets 3-5 mm.

Distribution: Interior Saskatchewan to Texas, west to California and Washington. **Oklahoma:** Harmon Co., Stevens; Kiowa Co., Stevens; Leedey, Reed; Norman, Prier; Watonga, Rapp; Watonga, Graff; Woods Co., Stevens

Remarks: This plant is found on salty and alkali soils. In certain alkali regions it is the best grass that will grow, but even so it is not a very good grazing grass.

REDFIELDIA Vasey

Tall perennial grasses with slender blades and long, open panicles with diffuse capillary branches; panicle about half the length of the stem; spikelets 3-5 flowered, rachilla articulate above the glumes and between the florets; glumes somewhat unequal; lemma 3-nerved; nerves parallel, densely villose at the base; palea 2-nerved.

Redfieldia flexuosa (Thurb.) Vasey. Redfield's grass. Blow-out grass.

Stems 3.5-12 dm. tall from creeping rootstocks; sheaths longer than the internodes; blades 3-5 dm. long, mostly near the base of the stem, smooth, involute; panicle about half the length of the stem with spreading branches; spikelets 4-7 mm. long on pedicels 2-3 cm. long; glumes acuminate; lemmas 5-6 mm. long, the callus densely pilose with long hairs.

Distribution: Wyoming to Colorado, Nebraska and Oklahoma. **Oklahoma:** Cimarron Co., Ortenburger; Rosston, Stevens.

Remarks: This plant is found on prairie soils. It is not abundant enough to be of any economic importance. Summer and fall.

Fig. 73. *Redfieldia flexuosa*

TRIPLASIS Beauv.

Annuals or perennials; stems slender, tufted, internodes short, sheaths containing cleistogamous flowers; spikelets few flowered, florets remote; rachilla slender, articulating above the glumes and between the florets; glumes nearly equal, smooth, 1-nerved; lemmas narrow, 3-nerved, 2-lobed, nerves parallel, silky-villose, midnerve excurrent as an awn as long as the lobes or longer; palea keels densely long-villose on upper half.

***Triplasis purpurea* (Walt.) Chapm.**

Annual, often purple; stems ascending or spreading, sometimes pubescent at the nodes, 3-7.5 dm. tall; blades flat or loosely involute; panicle 3-5 cm. long with few branches and few spikelets, auxiliary branches more or less inclosed in the loose sheaths; sheaths often containing cleistogamous flowers; spikelets 2-4 flowered, 6-8 mm. long; lemmas 3-4 mm. long, lobes rounded or truncate, nerves and callus short-villose, awn about as long as the lobes; palea silky-villose on upper half; fruit about 2 mm. long.

Distribution: New Hampshire to Minnesota and Nebraska, south to Florida and Texas. **Oklahoma:** Payne Co., Kiltz.

Remarks: Found on dry sandy soils. It is of little value economically.

TRIODIA R. Br.

Perennials with open, closed or spike-like panicles; spikelets 3 or more flowered; articulate above glumes and between spikelets; glumes unequal, keeled; lemmas 3-nerved.

- | | |
|--|------------------------|
| 1. Panicle ovate with a few crowded, large, pilose spikelets | 1. <i>T. pilosa</i> |
| Panicle conical or cylindrical, spikelets many | 2 |
| 2. Panicle open, branches spreading, often drooping | 2. <i>T. flava</i> |
| Panicle spike-like, branches appressed | 3 |
| 3. Second glume 3-5 nerved | 3. <i>T. elongata</i> |
| Second glume 1-nerved | 4 |
| 4. Panicle stout, erect, dense; spikelets crowded | 4. <i>T. stricta</i> |
| Panicle not stout or dense; spikelets not crowded | 5. <i>T. albescens</i> |

1. *Triodia pilosa* (Buckl.) Merr. Sharp-scaled *Triodia*. Gyphill-grass.

Stems tufted 0.5-2 dm. tall, smooth and glabrous; sheaths with a tuft of long white hairs on each side at the apex; blades erect or curved with folded white margins, long white hairs on the lower surface; panicle ovate, with a few large crowded spikelets; spikelets compressed, 1.5-3 cm. long, 8-12 flowered; glumes 1-nerved; lemmas 6-6.5 mm. long, 3-nerved; nerves and base pilose.

Distribution: Kansas to Oklahoma, Nevada and Mexico. **Oklahoma:** Cimarron Co., Stevens; Harmon Co., Stevens; Major Co., Stevens; Price's Falls, Stratton; Wichita Mts., Stemen & Myers; Woods Co., Stevens;



Fig. 74. *Triodia pilosa*

Roger Mills Co., Goodman; Greer Co. Bull; Murray Co., Demaree; Major Co., Demaree; Harmon Co., Demaree.

Remarks: This species is found on dry rocky soils. It furnishes some grazing in stony, semi-arid regions. Summer.

2. *Triodia flava* (L.) Smyth. (*Tridens flava* Hitchc.) Tall Red-top. Purple-top.

Stems 6-15 dm. tall, stout, erect; blades 1-3 dm. long or more, smooth beneath, scabrous above; panicle 1.5-4.5 dm. long, oily-viscid branches ascending, spreading or drooping; spikelets 4-8 flowered, 6-8 mm. long, purple; joints of the rachilla short; glumes 1-nerved, second glume 3.5-4 mm. long; lemma 4 mm. long, nerves pilose, slightly toothed.

Distribution: Massachusetts to Kansas south to Florida and Texas. **Oklahoma:** Bartlesville, Porter; Choctaw, Hildebrand; Dewey, Briggs & Porter; Fort Sill, English; Kay Co., Stevens; Keystone, Brodell; Muskogee Co., Pammel; Norman, Dye; Norman, Bruner; Norman, Stemen & Myers; Norman, Prier; Stillwater, Featherly; Stillwater, Stratton; Stillwater, Learn; Tulsa, De Yarmett; Woods Co., Stevens; Nardin, Smith; Osage Co., Penn.

Remarks: This species grows on a variety of soils. It furnishes some grazing and is a constituent of our prairie hay. Summer and fall.

3. *Triodia elongata* (Buckley) Nash. (*Tridens elongata* Nash.) Long-panicled *Triodia*.

Stems tufted, 3-9 dm. tall, erect; sheaths longer than the internodes; blades 4-25 cm. long, 3 mm. wide, rough; panicle 1-2.5 dm. long, branches appressed, somewhat distant; spikelets 8-10 flowered, 10-14 mm. long; first glume 1-nerved, second 3-5 nerved; lemma 5-6 mm. long, obtuse or 2-toothed at the apex, hairs on the midnerve and margins.

Distribution: Missouri and Kansas to Texas and Arizona. **Oklahoma:** Fort Sill, English; Muskogee Co., Little; Osage Co., Penn.

Remarks: This species is not common in Oklahoma.

4. *Triodia stricta* (Nutt.) Benth. (*Tridens stricta* Nash.) Narrow Three-toothed grass.

Stems tufted, 5-15 dm. tall, erect, rather stout; sheaths compressed; blades 1-6 dm. long, 2-7 mm. wide; panicle exserted, erect, spike-like, 12-20 cm. long, branches appressed; spikelets 4-10 flowered, 4-6 mm. long, crowded; glumes lanceolate, 1-nerved, subequal, 3-4 mm. long; lemma ciliate on the nerves, 3 mm. long, short awned or awn-pointed.

Distribution: Missouri to Kansas and southward; also in Arizona. **Oklahoma:** Muskogee Co., Little; Norman, Prier; Ottawa Co., Stevens; Stillwater, Featherly; Wagoner Co., Lowe; Osage Co., Ahrberg; Mayes Co., Lehman; Enid, Hurst; Osage Co., Penn.

Remarks: This species is found in moist places. It is common but not abundant enough in any one locality to be of any economic importance. Summer and fall.

5. *Triodia albescens* Vasey.

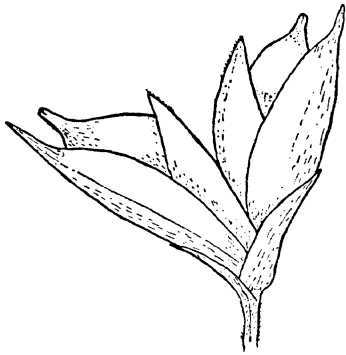
Stems tufted. 4-7 dm. tall, erect; sheaths smooth; blades flat or involute, 1.5-3 dm. long; panicle 9-14 cm. long, interrupted, branches ascending or appressed; spikelets 5-8 mm. long, 7-10 flowered; glumes broad, 1-nerved, slightly unequal; lemma nearly smooth, 3-3.5 mm. long.

Distribution: Colorado to Kansas south to Texas and New Mexico. **Oklahoma:** Fort Sill, English; Woods Co., Stevens; Osage Co., Penn.

Remarks: This species is found on the prairies in sandy regions. It is not common in Oklahoma.

DIARRHENA Beauv.

Perennial grass with slender rootstocks and long dark green, strongly keeled leaves and long narrow few-branched panicles; spikelets 3-5 flowered, rachilla articulated between the perfect florets; glumes unequal; lemmas broad, rounded on the back.



***Diarrhena americana* Beauv.**

Stems 4-12 dm. tall, erect, sheaths overlapping; blades 2-6 dm. long, 1-2 cm. wide somewhat folded; panicle sometimes raceme-like, 0.5-2 dm. long, branches erect, single, few-flowered; first glume 2-2.5 mm. long, second 3.5 mm. long; lemma 4 mm. or more long.

Distribution: Ohio to South Dakota south to Georgia and Texas. **Oklahoma:** Stillwater, Featherly; Tonkawa, Stevens; Osage Co., Penn.

Remarks: This plant is found on shady river banks and rich woods. It is grazed but little because of the coarseness of the leaves. Late summer and fall.

Fig. 75. *Diarrhena americana*

ERAGROSTIS Beauv.

Low or high, prostrate or erect, annuals or perennials, sometimes dioecious grasses usually with open panicles; blades flat or involute; spikelets 2-many flowered, more or less flattened; glumes unequal, usually shorter than the lemmas, 1-nerved, or the second 3-nerved; lemmas 3-nerved, keeled, lateral nerves sometimes obscure; palea shorter than its glume, with 1 nerve on keel.

- | | |
|--|--------------------------------|
| 1. Plants annual | 2 |
| Plants perennial | 9 |
| 2. Plants creeping, rooting at the nodes, forming mats | 3 |
| Plants often decumbent at base but not creeping and
mat forming | 4 |
| 3. Plants with perfect flowers; anthers 0.2 mm. long | 1. <i>E. hypnoides</i> |
| Plants dioecious; anthers 2 mm. long | 2. <i>E. reptans</i> |
| 4. Spikelets mostly less than 5-flowered; panicle diffuse,
two-thirds the entire length of the plant | 3. <i>E. capillaris</i> |
| Spikelets mostly more than 5-flowered | 5 |
| 5. Plants with small glandular depressions on branches and
keel of lemmas; panicle rather dense | 4. <i>E. cilianensis</i> |
| Plants not glandular on branches nor lemmas
(glandular below nodes on <i>E. barrelieri</i>) | 6 |
| 6. Spikelets about 1 mm. wide, linear; plants delicate | 5. <i>E. pilosa</i> |
| Spikelets 1.5 mm. or more wide, ovate to linear | 7 |
| 7. Panicle narrow; branches spikelet-bearing nearly to base;
spikelets linear | 6. <i>E. barrelieri</i> |
| Panicle open or diffuse | 8 |
| 8. Primary panicle branches or the lower with branchlets bearing
2 or 3 spikelets; spikelets loosely imbricated | 7. <i>E. pectinacea</i> |
| Primary panicle branches bearing appressed branchlets
with several spikelets thereby making the spikelets
closely imbricated | 8. <i>E. diffusa</i> |
| 9. Spikelets sessile or pedicels not more than 1 mm. long | 10 |
| Spikelets with pedicels more than 1 mm. long | 13 |
| 10. Spikelets sessile, distant on stout stiff panicle
branches | 9. <i>E. sessilispicata</i> |
| Spikelets short pediceled | 11 |
| 11. Panicle large, the axis and branches viscid. | 10. <i>E. curtipedicellata</i> |
| Panicle narrow (seldom open in <i>E. secundiflora</i>) not
viscid; ekels of palea forming a white band | 12 |
| 12. Lemmas 3 mm. long, abruptly acute at apex; panicle
reddish brown | 11. <i>E. secundiflora</i> |
| Lemmas 3.5 mm. long, acuminate at apex; panicle pale
to pinkish | 12. <i>E. beyrichii</i> |
| 13. Nerves of lemma obscure; lemma rounded on the back or
slightly keeled toward the apex | 14 |
| Nerves of lemma evident to prominent; lemmas keeled | 15 |
| 14. Sheaths pilose or hirsute | 13. <i>E. hirsuta</i> |
| Sheaths glabrous or nearly so, except at summit | 14. <i>E. lugens</i> |
| 15. Panicle about as broad as long, purple, branches
slender, rigid | 15. <i>E. spectabilis</i> |
| Panicle longer than broad, branches not horizontally
spreading | 16 |
| 16. Spikelets usually not more than 6-flowered, purple | 16. <i>E. trichodes</i> |
| Spikelets usually 8-15 flowered, stramineous
to bronze | 17. <i>E. pilifera</i> |



Fig. 76. *Eragrostis hypnoides*

1. *Eragrostis hypnoides* (Lam.) B. S. P.
Smooth Creeping Love-grass.

Plants imperfectly dioecious; stems 2-5 dm. long, creeping, rooting at the nodes, branched, branches ascending; blades pubescent above, sometimes below, 1-4 cm. long, 1-2 mm. wide; panicle 1.5-5 cm. long; spikelets 10-35 flowered, 4-16 mm. long or more; glumes acute 0.5-1 mm. long; lemma about 2 mm. long, longer than the palea; palea ciliate on the keel.

Distribution: Canada to Mexico. **Oklahoma:** Bower, McLaughlin; Grant Co., Stevens; Illinois River, Prier; Lamont, Stevens; Ottawa Co., Stevens.

Remarks: This species is found on sandy or gravelly shores and dry stream beds. It is of little economic importance. Summer and fall.

2. *Eragrostis reptans* (Michx.) Nees. Hairy Creeping Love-grass.

Plants dioecious; stems creeping, branching, rooting at the nodes; ascending branches 6-10 cm. tall arising from the rooting nodes; sheaths pubescent, blades wide, flat, pubescent, 1-3 cm. long, 1.5-3 mm. wide; panicle 2-3 cm. long, ovate; spikelets clustered, 20-30 flowered, 6-14 mm. long.

Distribution: Nebraska, Oklahoma, Arkansas, Louisiana, Texas, and New Mexico. **Oklahoma:** Cherokee Outlet, Carleton; False Washita, Palmer; Fort Arbuckle, Palmer; Fort Cobb, Palmer; 101 Ranch, Featherly; Muskogee Co., Little.

Remarks: This species resembles quite closely *E. hypnoides*, both in habit and habitat. Summer.

3. *Eragrostis capillaris* (L.) Nees. Lace-grass. Tiny Love-grass.

Stems 2-5 dm. tall, tufted, erect, slender, branching at the base; sheaths overlapping, smooth or sparingly hairy, throat bearded; blades long-acuminate, smooth beneath, scabrous above; panicle diffuse, 1-4 dm. long, open, branches ascending; spikelets single on long pedicels, ovate, 2-3 mm. long, 2-4 flowered; glumes 1-nerved, 1-1.3 mm. long; lemma obscurely 3-nerved, 1.5 mm. long; palea 3-toothed, ciliate on the keel.



Fig. 77. *Eragrostis capillaris*

Distribution: Rhode Island to New York, Missouri and Oklahoma, southward to Georgia and Texas. **Oklahoma:** Muskogee Co., Little; Norman, Prier; Osage Co., Stevens; Wichita Mts., Stemen & Myers; Osage Co., Penn.

Remarks: This grass is found on dry soils. It is of but very little economic importance. Summer and fall.

4. *Eragrostis cilianensis* (All.) Link.
(*E. major* Host. *E. megastachya* Link.)
Strong-scented Love-grass. Candy-grass.
Spike-grass.

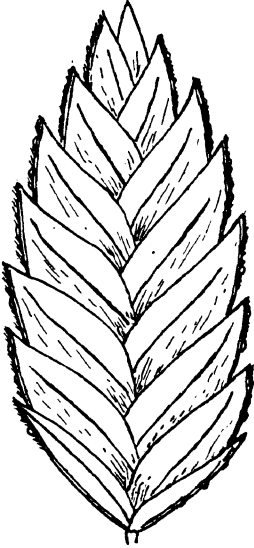


Fig 78. *Eragrostis cilianensis*

Stems 1.5-6 dm. tall, erect or decumbent, much branched; sheaths sparingly pilose at the throat; blades flat, smooth beneath, scabrous above; panicle 5-15 cm. long, rather dense, branches spreading or ascending; spikelets linear or oblong, flattened, 8-50 flowered; 5-20 mm. long, 3 mm. wide; glumes unequal, 1-nerved, 1.5-2 mm. long; lemmas oval, 3-nerved, lateral nerves conspicuous, 2 mm. long; palea ciliate on the keel.

Distribution: Found throughout most of North America. **Oklahoma:** Apache, Flynn; Fort Sill, English; Guthrie, Dobson; Harmon Co., Stevens; Muskogee Co., Little; Muskogee Co., Pammel; Newkirk, Riddell; Norman, Prier; Norman, Larkin; Oklahoma City, Trough; Oklahoma Co., Stemen & Myers; Stillwater, Stratton; Stillwater, Featherly; Watonga, Graff; Woods Co., Stevens; El Reno, Childers; Rocky, McCannon; Kingfisher; Byers; Nardin, Smith; Claremore, Brunkow; Osage Co., Penn.

Remarks: This species is a weed in lawns, on roadsides and waste places. It is of little or no economic importance. Summer and fall.

5. *Eragrostis pilosa* (L.) Beauv. Small Tufted Love-grass.

Stems tufted, 1.5-5 dm. tall, slender, erect or ascending, branched; sheaths shorter than the internodes, smooth, sometimes pilose at the throat; blades smooth beneath, scabrous above, long acuminate; panicle 0.5-1.5 dm. long, branches erect or spreading, sometimes hairy in the axils; spikelets 5-12 flowered, 3-6 mm. long, 1 mm. wide; glumes thin, the second one 1-nerved, about 1.5 mm. long; lemmas 1.5-2 mm. long.

Distribution: Massachusetts to Michigan and Kansas southward. **Oklahoma:** Cleo, Stevens; Keystone, Brodell; Logan Co., Stevens; Norman, Prier; Ottawa Co., Stevens; Washington Co., Stevens; Claremore, Brunkow; Osage Co., Penn.

Remarks: This species is found in lawns, cultivated fields and waste places. It is of no economic importance. Summer and fall.



Fig. 79. *Eragrostis pilosa*

6. *Eragrostis barrelieri* Daveau.

Stems tufted, erect, or decumbent at the base, branched, 2-5 dm. tall, often a glandular band just below the node; sheaths pilose at throat, loose, usually including a branch; blades short and flat; panicle open, narrow, 8-15 cm. long, branches ascending, few-flowered with spikelet almost to the base, axils glabrous; spikelets oblong-linear, 12-15 flowered, about 1 cm. long, 1.5 mm. wide, dark olive color; lemmas about 2 mm. long.

Distribution: Kansas, Oklahoma, Texas, Arizona to California. **Oklahoma:** Elk City, Penn; Guthrie, Penn.

Remarks: A weed introduced from Europe.

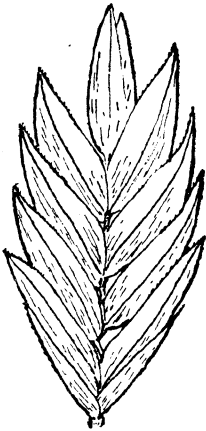


Fig. 80. *Eragrostis pectinacea*

7. *Eragrostis pectinacea* (Michx.) Nees.
(*E. purshii* Schrad. *E. caroliniana* (Spreng)
Scribn.) Southern Spear-grass.

Stems tufted, 1.5-5 dm. tall, slender, branched, decumbent at the base, smooth and glabrous; sheaths loose, smooth and glabrous, shorter than the internodes; blades smooth beneath, scabrous above; panicle 7-20 cm. long, open, spreading, axils naked; spikelets 5-15 flowered, 3-8 mm. long, 1.5 mm. wide; glumes unequal, the first two-thirds as long as the second; lemma 1.5 mm. long.

Distribution: Found throughout the United States. **Oklahoma:** Altus, Stevens; Altus, Forrester; Cleveland Co., Prier; Muskogee Co., Little; Oklahoma Co., Stemen & Myers; Woods Co., Stevens.

Remarks: This species is found on dry soils. It affords some grazing where it is abundant enough. Summer and fall.

8. *Eragrostis diffusa* Buckl.

Stems 3-5 dm. tall, tufted, erect or geniculate; sheaths glabrous; lower ones hairy at summit; blades narrow, 5-15 cm. long; panicle half the length of the plant, often included at the base, primary branches ascending, secondary branches more or less appressed; spikelets 5-8 mm. long, 6-12 flowered, oblong lanceolate; glumes sub-equal; lemma about 2 mm. long, nerves prominent.

Distribution: Oklahoma and Texas to Nevada and California south to Mexico. Introduced in Missouri, South Carolina, Alabama and Louisiana. **Oklahoma:** Alva, Stevens.

Remarks: A weed in fields and open ground.



Fig. 81. *Eragrostis sessilispicata*

9. *Eragrostis sessilispicata* Buckl.

Stems 3-5 dm. tall, erect, slender, blades of sterile shoots 3-15 cm. long, 2 mm. wide; panicle much exerted, simple, open, pyramidal, 2-5 dm. long, branches stiff; spikelets sessile, distant, appressed, 6-9 mm. long, 6-9 flowered; glumes sub-equal, 4-5 mm. long; first glume 1-nerved, second 2-nerved; lemma firm, 3-nerved, 4 mm. long.

Distribution: Oklahoma, Texas and New Mexico. **Oklahoma:** Blaine Co., Stevens; Logan Co., Stevens; Longdale, Stevens; Woods Co., Stevens.

Remarks: This species is found on dry sandy soil. It is of no economic importance.

10. *Eragrostis curtipedicellata* Buckl.
Short-stalked Love-grass.

Stems 3-9 dm. tall, rigid, simple, smooth, erect or decumbent at the base; sheaths smooth, overlapping, ciliate at the throat; blades smooth beneath, scabrous above; panicle 1-3 dm. long, diffuse, branches wide spreading; ciliate in the axils, spikelets pedicellate, 6-12 flowered, 4-6 mm. long, compressed; glumes somewhat unequal, 1-nerved, scabrous on the keel; lemma about 2 mm. long; palea somewhat ciliate on the keels, 1.5 mm. long.



Fig. 82. *Eragrostis curtipedicellata*

Distribution: Kansas to Texas. **Oklahoma:** Fort Sill, English; Granite, Stevens; Norman, Prier; Stillwater, Stratton; Wichita Mts., Stemen & Myers; Woods Co., Stevens; Osage Co., Penn.

Remarks: This is a grass of the prairies. It is not abundant enough to be of any importance. It is only one of the filler grasses of the prairie. Summer and fall.

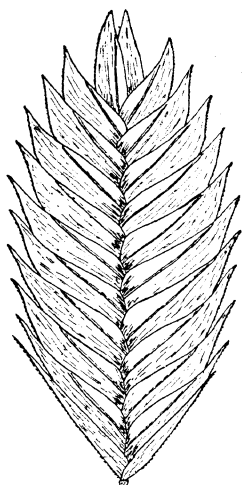


Fig. 83. *Eragrostis secundiflora*

11. *Eragrostis secundiflora* Presl. Clustered Love-grass.

Stems tufted 1-9 dm. tall, erect, simple, smooth and glabrous; sheaths shorter than the internodes, blades 0.5-3 dm. long; panicle 4-15 cm. long, branches short, erect; spikelets clustered, flattened, 8-20 flowered, 6-14 mm. long, 3-4 mm. wide.

Distribution: Kansas to Colorado south to Texas and Florida. **Oklahoma:** Harrah, Ridge; Muskogee Co., Little; Norman, Prier; Norman, Bruner; Oklahoma Co., Stemen & Myers; Payne Co., Learn; Watonga, Graff; Woods Co., Stevens; El Reno, Childers; Love Co., Forbs; Kingfisher, Byers; Osage Co., Penn.

Remarks: This species is found on dry soils. It is rather coarse and seldom very abundant. Summer and fall.

12. *Eragrostis beyrichii* J. G. Smith. Beyrich's Love-grass.

Stems tufted, 2-5 dm. tall, erect, slender; sheaths shorter than internodes; blades 1-2.5 dm. long, slender, involute when dry; panicles 4-15 cm. long, branches short, ascending; spikelets clustered, 1-1.5 cm. long, 4-5 mm. wide; glumes unequal, the lower shorter; lemmas 4 mm. long.

Distribution: Oklahoma to Texas and New Mexico. **Oklahoma:** Wichita Mts., Featherly.

Remarks: This plant is rare in Oklahoma and is of no economic importance. Summer.

13. *Eragrostis hirsuta* (Michx.) Nees.

Stems erect, tufted, 5-12 dm. tall; sheaths more or less hirsute, pilose at the throat; blades flat, 5-10 mm. wide, involute-attenuate toward the tip; panicle diffuse, more than half the height of the entire plant; branches long, flexuous, pilose in the axils; spikelets ovate to ovate-oblong, usually 2-6 flowered, 3-4 mm. long; glumes 1.5 and 2 mm. long; lemma 2 mm. long.

Distribution: Maryland to Missouri, southward to Florida and eastern Texas. **Oklahoma:** Payne Co., Gernert; Osage Co., Penn.

Remarks: Found on dry sandy soil where there is little shade. It is of little economic importance.



Fig. 84. *Eragrostis hirsuta*



Fig. 85. *Eragrostis lugens*

14. *Eragrostis lugens* Nees.

Stems tufted 2-6 dm. tall, slender; sheaths more or less pubescent, with spreading hairs, slightly keeled; blades ciliate, flat or involute; panicle 2-3.5 dm. long, ovoid, sometimes included at the base, axils hairy; spikelets 4-5 flowered, 3-4 mm. long, oval; glumes ovate, 1-nerved, unequal; lemma about 2 mm. long, lateral nerves not conspicuous.

Distribution: Florida to Oklahoma, Mexico and South America. **Oklahoma:** Stillwater, Featherly; Stillwater, Stratton; Osage Co., Penn.

Remarks: This grass is found on dry soils. It is of little or no economic importance. Spring to fall.

15. *Eragrostis spectabilis* (Pursh.) Steud. *E. pectinacea* (Michx.) Nees of most manuals. Purple Love-grass. Pink-grass. False Red-top.

Stems tufted, 3-6 dm. tall, firm, simple and smooth; sheaths overlapping, the upper one often including the base of the panicle; blades rigid flat or involute, smooth below, often hairy above; panicle diffuse, compound, often purple, 2-3 dm. long; bearded in the axils; spikelets linear, 5-12 flowered, 4-8 mm. long; glumes 1-nerved, scabrous on the keels; lemmas 1.5-2 mm. long, lateral nerves prominent; palea ciliate on the nerves.

Distribution: Maine to South Dakota, south to Florida and Texas. **Oklahoma:** Muskogee Co., Little; Norman, Prier; Norman, Stemen & Myers; Osage Co., Stevens; Stillwater, Stratton; Stillwater, Featherly; Indian Territory, Carleton; Claremore, Brunkow; Osage Co., Penn.

Remarks: This species is found on dry soil. It is of but little economic importance. Summer and fall.

16. *Eragrostis trichodes* (Nutt.) Nash. Hair-like Love-grass. Blow-out-grass.

Stems 6-12 dm. tall, erect, simple and smooth; sheaths overlapping, pilose at the throat; blades long and slender, smooth beneath, somewhat scabrous above; panicle 2-7 dm. long, narrow, branches spreading, lower axils often hairy; spikelets 3-10 flowered, 5-9 mm. long; glumes about equal; the lower lemmas about 3 mm. long.

Distribution: Illinois to Nebraska south to Texas. **Oklahoma:** Alva, Stevens; Choctaw, Rols; Fort Sill, English; Major Co., Stevens; Muskogee Co., Little; Muskogee Co., Pammel; Perkins, Featherly; Ripley, Learn; Ripley, Featherly; Stillwater, Learn; Tonkawa, Stevens; Watonga, Rapp; Woods Co., Stevens; Oakwood, Price; Osage Co., Penn.

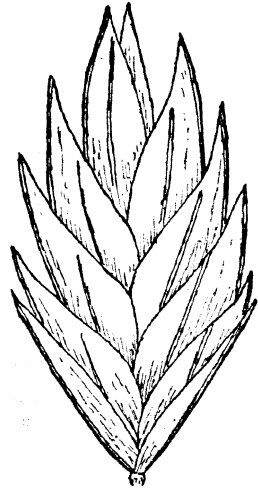


Fig. 86. *Eragrostis trichodes*

Remarks: This species is found on dry sandy soil. It furnishes some grazing when young, but it soon becomes coarse and unpalatable. Summer and fall.

17. *Eragrostis pilifera* Scheele.

Stems tufted, erect, 6-12 or more dm. tall; sheaths pilose at the summit; blades flat to involute, tapering to a slender point; panicle diffuse oblong, about half the length of the stem; spikelets straw-color, 8-15 flowered, oblong to lanceolate, 8-12 mm. long; glumes and lemmas about 3 mm. long.

Distribution: Sand hills and sand barrens from Illinois to Nebraska south to Texas. **Oklahoma:** Sapulpa, Bush; Osage Co., Penn; Payne Co., Gernert.

Remarks: It may be of some use as a sand binder.

UNIOLA L.

Perennial, usually tall grasses with broad flat or involute leaves and narrow or open panicles of flat, sometimes very broad, spikelets. Panicles sometimes nodding; spikelets 3-many flowered; 1 or 2 sterile lemmas below; glumes and lemmas compressed, sometimes conspicuously so; rachilla articulated above the glumes and between the florets; upper floret sometimes staminate.

Inflorescence long, very slender, often nodding at the apex 1. *U. laxa*
 Inflorescence not slender, spikelets broad pendulous 2. *U. latifolia*

1. *Uniola laxa* (L.) B. S. P. Slender Spike-grass.

Stems 5-12 dm. tall, erect, slender; sheaths smooth or pubescent; blades 1-4 dm. long, 2-6 mm. wide; flat or involute; panicle 2-4 dm. long, slender, straight, branches spike-like, appressed; spikelets 3-6 flowered, about 5-10 mm. long; glumes much shorter than the lemmas; lemmas 4-5 mm. long.

Distribution: Pennsylvania to Oklahoma, south to Florida and Texas. **Oklahoma:** Indian Territory, Sheldon; LeFlore Co., Stevens; Murray Co., Featherly.

Remarks: This species is rare and is of no economic importance. Summer and fall.



Fig. 87. *Uniola laxa*



Fig. 88. *Uniola latifolia*

2. *Uniola latifolia* Michx.
Broad-leaved Spike-grass.

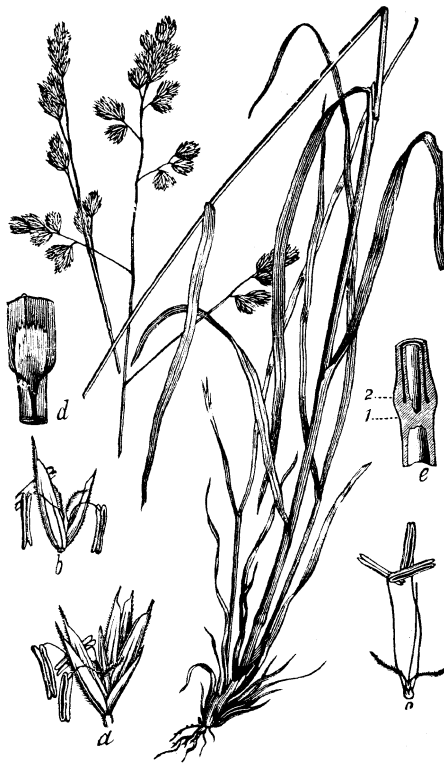
Stems 6-12 dm. tall, erect, simple and smooth; sheaths strongly striated; blades 1-2 dm. long, 1.5-2.5 cm. wide, flat; panicle loose, 1.5-3 dm. long, nodding, branches capillary, pendulous; spikelets ovate-lanceolate, many flowered, much flattened, 2-3 cm. long; glumes subequal; lemmas 10-13 mm. long; keel of lemma winged and hispid.

Distribution: Pennsylvania, Illinois and Kansas, southward to Florida and New Mexico. **Oklahoma:** Comanche Co., Stevens; Fay, Davis; Fort Sill, English; Hinton, Stevens; Indian Territory, Sheldon; LeFlore Co., Stevens; Muskogee Co., Little; Muskogee Co., Pammel; Norman, Prier; Norman, Stemen & Myers; Norman, Bruner; Ottawa Co., Stevens; Ripley, Schultz; Tonkawa, Stevens; Wagoner, Lowe; Osage Co., Penn.

Remarks: This species is found in moist shady places. It forms some grazing where it is abundant. This is a very beautiful grass and has possibilities of becoming an ornamental plant. Summer and fall.

DACTYLIS L.

Perennial coarse grasses with flat blades and open panicles; spikelets few flowered, compressed; spikelets in dense one-sided clusters at the ends of the few branches of the panicle; glumes unequal, ciliate on the keel; lemma 5-nerved, ciliate on the keel.



Dactylis glomerata L. Orchard-grass. Cock's-foot-grass.

Stems tufted, 6-12 dm. tall, stout, erect or geniculate at base; sheaths loose, rough with conspicuous hyaline ligule; blades 1.5-3 dm. long, wide, flat, rough; panicle 1-2 dm. long, branches few, spreading or ascending; spikelets 3-5 flowered, crowded in one-sided clusters at the ends of the panicle branches; glumes unequal, more or less ciliate on the keel; lemmas 4-6 mm. long, ciliate on the keel, awned or awn-pointed.

Distribution: Found throughout the United States and southern Canada. **Oklahoma:** Guthrie, Wiley; Norman, Prier; Norman, Stemen & Myers; Oklahoma City, Stemen & Myers; Sapulpa, Kissick.

Remarks: This plant is grown for forage in some regions. It has escaped from cultivation and is a weed in fields and waste places. Introduced from Europe. Summer.

Fig. 89. *Dactylis glomerata*
(U. S. D. A. Div. Agros.)

BROMUS L.

Annual or perennial grasses varying from low to rather tall, with closed sheaths, flat blades, and terminal panicles; spikelets few to many flowered, rachilla articulating above the glumes and between the florets; glumes unequal; lemmas keeled or rounded on the back, 2-toothed at the apex, awned from between the teeth or awnless.

- 1. Lower glume 1-nerved, the upper 3-nerved 2
 Lower glume 3-5 nerved, the upper 5-9 nerved 5
- 2. Awns longer than the lemma, annual 1. *B. tectorum*
 Awns shorter than the lemma, perennial 3
- 3. Lemmas awnless or awn-pointed 2. *B. inermis*
 Lemmas with distinct awns 4
- 4. Sheaths shorter than the internodes; nodes 4-6 3. *B. purgans*
 Sheaths longer than the internodes; nodes 10-20 4. *B. latiglumis*

5. Lemmas with compressed keel 5. *B. catharticus*
 Lemmas rounded on the back, at least below 6
6. Nerves of lemma obscure; sheaths glabrous 6. *B. secalinus*
 Nerves of lemma prominent; sheaths pubescent 7. *B. commutatus*

1. ***Bromus tectorum* L.** Downy Brome-grass.

Stems 1.5-6 dm. tall, erect, simple, smooth; sheaths, at least the lower ones, velvety pubescent; blades 3-10 cm. long, 2-4 mm. wide, pubescent; panicle 0.5-1.5 dm. long, branches slender and drooping; spikelets numerous 5-8 flowered on capillary recurved pedicels; glumes unequal, rough to hirsute, the second longer; lemma 8-12 mm. long, 7-nerved, awn 12-16 mm. long.

Distribution: Maine to Ontario south to Oklahoma, Missouri, Ohio and Maryland. **Oklahoma:** Oklahoma Co., Stemen & Meyers; Vinita, Burge.

Remarks: This species is a weed in fields and waste places. Introduced from Europe. Spring and summer.



Fig. 90. *Bromus inermis*

2. ***Bromus inermis*.** Leyss. Hungarian Brome-grass. Awnless Brome-grass.

Stems tufted, 6-12 dm. tall; sheaths smooth, glabrous; blades 2.5 dm. long or less. smooth; panicle 1.5-2.5 dm. long, axis and branches hispidulous, branches ascending in half whorls; spikelets 2-4 dm. long, first glume 1-nerved, second 3-nerved; lemmas 5-6 mm. long, 5-7 nerved, awnless or awn pointed.

Distribution: South Dakota to Oklahoma, Ohio and Colorado. **Oklahoma:** Stillwater, Klages.

Remarks: This species is a weed in fields and waste places. Summer.

Fig. 91. *Bromus purgans*

3. **Bromus purgans** L. Hairy Wood-chess. Wild Chess.

Stems erect 6-15 dm. tall, more or less pubescent; sheaths more or less retrorsely short-pilose; blades flat, scabrous; panicle 1.5-3 dm. long, open, nodding, axis and branches scabrous; spikelets 7-12 flowered, 2-2.5 cm. long; first glume 1-nerved, second 3-nerved; lemma 10-12 mm. long, pubescent on the back, awn straight 4-6 mm. long.

Distribution: Found throughout eastern and central United States. **Oklahoma:** Cad-do Co., Stevens; Fort Sill, English; Kay Co., Stevens; Logan Co., Stevens; Muskogee Co., Little; Norman, Prier; Stillwater, Stratton; Stillwater, Klages; Tonkawa, Stevens; Osage Co., Penn.

Remarks: This species grows in moist woods and along stream banks. It is of no economic importance. Summer.

4. **Bromus latiglumis** (Shear) Hitchc.

Stems slender, erect, 7-12 dm. tall, usually 10-20 nodes; sheaths longer than the internodes, overlapping, more or less retrorsely pilose to glabrous; blades 10-30 cm. long, 10 mm. or less wide, tapering toward each end; panicle 15-25 cm. long, branches long, slender, drooping; spikelets pubescent; second glume 10 mm. long, 3-nerved, first glume two-thirds as long as second and 1-nerved; lemma about 10 mm. long exclusive of awn which is 4-8 mm. long.

Distribution: Along the alluvial banks of streams from Maine to eastern Montana, south to North Carolina and Oklahoma. **Oklahoma:** Fort Sill, Clemens.

Remarks: This grass is not abundant enough to be of much economic importance. This plant is quite similar to **B. purgans**.

5. **Bromus catharticus** Vahl. Southern Chess. Rescue-grass.

Stems annual, 5-10 dm. tall, stout, erect, simple and smooth; sheaths smooth or pubescent; blades rough, 2.5 dm. long or less; panicle 1.5-2 dm. long, branches erect or ascending; spikelets much compressed; lanceolate 6-10 flowered, 2.5-3.5 cm. long; glumes unequal; lemma 12-16 mm. long, awnless or awn-pointed.

Distribution: Alabama, Missouri, Oklahoma and California southward into Mexico. **Oklahoma:** Alfalfa Co., Stevens; Cherokee, Newton; Cherokee, Newbrown; Fort Sill, English; Harmon Co., Stevens; Hobart, Diehl; Love Co., Stevens; Mannsville, Griffiths; Mountain Park, Capps; Norman, Bruner;

Fig. 92. *Bromus catharticus*

Norman, Prier; Oklahoma Co., Stemen & Myers; Payne Co., Schultz; Stillwater, Stratton; Swanson Co., Stevens; Vinita, Burge; Washita Co., Stevens.

Remarks: This species furnishes some early grazing in the southern part of the state. It is often a weed in lawns and waste places. Spring and summer.



Fig. 93. *Bromus secalinus*

6. Bromus secalinus L. Cheat. Chess. Cook-grass.

Stems 3-9 dm. tall, erect, sheaths usually glabrous; blades smooth or rough; panicle 0.5-2 dm. long, branches ascending or drooping; spikelets 5-10 flowered, 8-16 mm. long, oblong-ovate; glumes unequal, first shorter, 3-nerved, second about 5 mm. long, 7-nerved; lemmas 6-8 mm. long, awns 7 mm. long or less.

Distribution: Found throughout temperate North America. **Oklahoma:** Chattanooga, Besemer; Dewey Co., Stevens; Fort Sill, English; Jay, Kissick; Muskogee Co., Little; Norman, Prier; Oklahoma Co., Stemen & Myers; Ryan, Stinson; Stillwater, Stratton; Washington Co., Stevens.

Remarks: This species is a weed in fields and waste places. Summer.

7. Bromus commutatus Schrad. Upright Chess.

Stems 3-7 dm. tall, erect, simple; sheaths retrorsely pubescent; blades pubescent; panicle 1.5-2.5 dm. long, branches erect or ascending; spikelets 5-9 flowered, 1.5-2 cm. long, nodding, glumes oval, acute, first 6 mm. long, second 8 mm. long; lemmas 6-8 mm. long, oval-obovate, awn about as long as the lemma, arising just below the 2-toothed apex.

Distribution: Found throughout the United States and Canada. **Oklahoma:** Cleveland Co., Prier; Fort Sill, English; Muskogee Co., Little; Norman, Bruner; Stillwater, Featherly; Claremore, Brunkow; Osage Co., Penn.

Remarks: This grass is a weed in waste places. Summer.



Fig. 94. *Bromus commutatus*

POA L. Bluegrasses

Annuals, biennials, or perennials, low to medium tall, usually perfect grasses with open or closed panicles; spikelets 2-several flowered, articulating above the glumes and between the florets, upper floret reduced or rudimentary; lemmas often with a tuft of long white webby hairs at the base.

- | | |
|---|--------------------------|
| 1. Annuals or biennials, low, stems 3 dm. tall or less | 2 |
| Perennials, stems 3 dm. tall or more | 4 |
| 2. Lemmas not webby at base, 5-nerved | 1. <i>P. annua</i> |
| Lemmas webby at base, 3-nerved | 3 |
| 3. Lemmas 2.5 mm. long | 2. <i>P. chapmaniana</i> |
| Lemmas 3-3.5 mm. long | 3. <i>P. bigelovii</i> |
| 4. Stems densely tufted | 5 |
| Stems not tufted; creeping rootstocks | 6 |
| 5. Lemmas webby at base | 4. <i>P. pratensis</i> |
| Lemmas not webby at base; panicle contracted | 5. <i>P. arida</i> |
| 6. Plants perfect; lemma naked or hairy at base | 6. <i>P. compressa</i> |
| Plants dioecious, pistillate lemma conspicuously
hairy at base | 7. <i>P. arachnifera</i> |

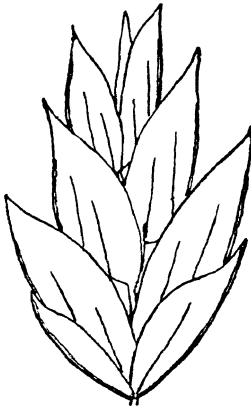


Fig. 95. *Poa annua*

1. *Poa annua* L. Annual Blue-grass.
Dwarf Meadow-grass. Low Spear-grass.

Stems 0.5-3 dm. tall, erect or decumbent at the base, compressed; sheaths loose, often overlapping; blades flat, conduplicate; panicle 1-10 cm. long, spreading; spikelets 3-7 flowered; second glume 3-nerved, 2.5 mm. long; lemma 2.5-3 mm. long.

Distribution: Found throughout most of North America. **Oklahoma:** Ardmore, Stevens; Muskogee Co., Little; Oklahoma Co., Stemen & Myers; Stillwater, Stratton; Tahina, Brook.

Remarks: This species is common in lawns. However, it is not a very satisfactory lawn grass. Spring to fall.

2. *Poa chapmaniana* Scribn.
Chapman's Spear-grass.

Stems 0.5-2 dm. tall, smooth; sheaths tight, ligule 3 mm. high; blades flat or conduplicate; panicle 3-5 cm. long; spikelets 3-7 flowered, 2.5-4 mm. long; lemmas pubescent at the base, sometimes pubescent on the nerves.

Distribution: Kentucky to Tennessee and Oklahoma, southward to Alabama. **Oklahoma:** Fort Sill, Clemens; Norman, Prier; Norman, Bruner; Oklahoma Co., Stemen & Myers.

Remarks: This species is found on dry soil. It is more or less common in lawns. However, it does not make a good lawn grass because it matures before fall. Spring.



Fig. 96. *Poa chapmaniana*
U. S. D. A. Div. Agros.

3. *Poa bigelovii* Vasey & Scribn.

Stems 2-7 dm. tall, flat; blades flat or conduplicate, 3-10 cm. long, apex acute; panicle closed or spreading, branches few, spikelets more or less secund on the outer half of the branches; spikelets 3-6 flowered, 5-7 mm. long; glumes 3-nerved; lemmas notched at the apex, webby hairs at the base.

Distribution: Oklahoma, Texas and Arizona. **Oklahoma:** Stillwater, Stratton.

Remarks: This species is comparatively rare in Oklahoma. Spring.



Fig. 97. *Poa bigelovii*



Fig. 98. *Poa pratensis*

excellent lawn grass where there is sufficient water. It is more common in the eastern part of the state than in the central or western. Summer.

5. *Poa arida* Vasey. Prairie Spear-grass. Prairie Bunch-grass.

Stems 3-6 dm. tall, erect, simple, smooth; sheaths usually overlapping; blades smooth beneath, 4 dm. long or less; panicle contracted, 2.5-12 cm. long; spikelets 4-7 flowered, 5-7 mm. long; lemma 3-4 mm. long, lower half silky pubescent.

Distribution: Oklahoma to Utah northward to Wyoming to North Dakota and Manitoba. **Oklahoma:** Cleveland Co., Prier; Harper Co., Stevens; Oklahoma Co., Stemen & Myers.

Remarks: This species is found on prairie soils. It is not abundant enough to be of importance in Oklahoma. Spring to fall.

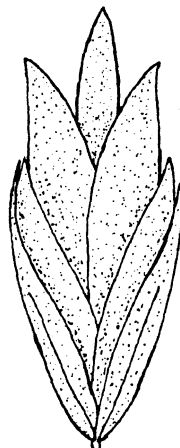


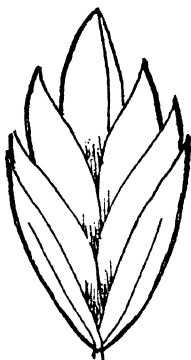
Fig. 99. *Poa arida*

4. *Poa pratensis* L. Kentucky Blue-grass. June-grass.

Stems 3-9 dm. tall, smooth, slender from running rootstocks; sheaths smooth, compressed; blades variable in length and width; panicle 6-15 cm. long, pyramidal, branches in half whorls; spikelets 3-5 flowered, 4-5 mm. long; lemmas 5-nerved, 3 mm. long, densely webbed at the base.

Distribution: Found throughout North America. **Oklahoma:** Beaver Co., Stevens; Cimarron Co., Stevens; Fort Sill, English; Garvin Co., Stevens; Harper Co., Stevens; Kingfisher Co., Stevens; Muskogee Co., Little; Norman, Prier; Oklahoma Co., Stemen & Myers; Stillwater, Stratton.

Remarks: This species is found in meadows, fields, and waste places where the soil is reasonably moist. It makes an

Fig. 100. *Poa compressa*

6. *Poa compressa* L. Canadian Blue-grass. Wire-grass. Flat-stemmed Meadow-grass. English Blue-grass.

Stems 1.5-6 dm. tall, smooth, compressed, decumbent at the base; from long branching rootstocks; sheaths shorter than the internodes; compressed, blades flat; panicle contracted, 5-10 cm. long, branches erect or ascending; spikelets 3-9 flowered, 3-6 mm. long; lemma 2-2.5 mm. long, pubescent.

Distribution: Found throughout most of North America. **Oklahoma:** Alfalfa Co., Stevens; Cherokee, Stevens; Fort Sill, English; Hinton, Stevens; Kenton, Stevens; Page, Porter.

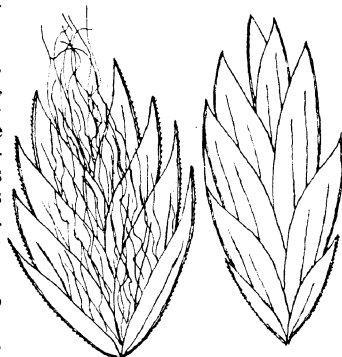
Remarks: This species is very palatable but is not abundant enough in Oklahoma to be of much importance.

7. *Poa arachnifera* Torr. Texas Blue-grass.

Dioecious, stems 3-9 dm. tall, smooth, from running rootstocks; sheaths overlapping, hyaline on the margins; blades smooth beneath, rough above, abruptly acute; panicle dense, often interrupted; spikelets 4-7 flowered; glumes unequal, 5 mm. long, hispidulous on the midnerve; lemma of pistillate spikelets with copious long cobwebby hairs at the base, those of staminate spikelets with few cobwebby hairs at the base.

Distribution: Kansas southward to Florida, Texas and New Mexico. **Oklahoma:** Ellis Co., Clifton; Fort Sill, English; Fort Sill, Stokes; Norman, Prier; Oklahoma City, Foster; Oklahoma Co., Stemen & Myers; Ripley, Featherly; Stillwater, Stratton; Woods Co., Stevens; Osage Co., Penn.

Remarks: This species is found on the prairies. It grows in small patches and although common it is not very abundant in any one place. It is quite palatable and is grazed closely by livestock. Spring.

Fig. 101. *Poa arachnifera*

MELICA L.

Rather tall perennial grasses with closed sheaths, flat blades; spikelets 2-several flowered, the rachilla disarticulating above the glumes and between the florets, terminal floret rudimentary; glumes papery, more or less unequal; lemma round on back.

Fig. 102. *Melica nitens***Melica nitens** (Nutt.) Tall Melic-grass.

Stems 4-14 dm. tall, simple, smooth and glabrous from rootstocks; sheaths closed; blades somewhat rough; panicle 1.5-2.5 dm. long, open or closed, branches spreading or ascending; spikelets secund, usually 3-flowered, nodding on slender, pubescent pedicels; glumes broad, subequal, papery; lemmas scabrous, 7-9 mm. long, terminal flower truncate at apex.

Distribution: Pennsylvania to Nebraska southward. **Oklahoma:** Bradley, Todd; Fort Sill, English; Norman, Prier; Wichita Mts., Stemen & Myers; Wichita Mts., Rose.

Remarks: This plant is found in woods and on rocky cliffs. It is not abundant enough to be of any importance. Spring and summer.

GLYCERIA R. Br.

(Panicularia Heister.)

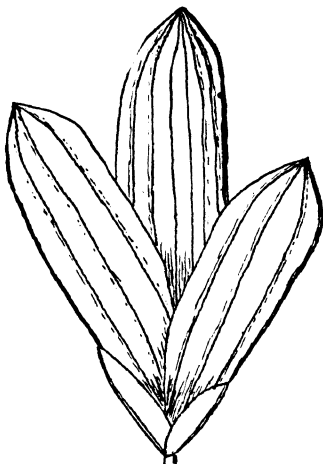
Usually tall, perennial grasses of moist places with closed sheaths and open panicles; spikelets few to many flowered, rachilla articulating above the glumes and between the florets; glumes short, unequal; lemmas awnless, 5-9 nerves parallel and usually prominent.

Glyceria striata (Lam.) Hitchc. (G. *nervata* Trin. *Panicularia nervata* Willd.) Meadow-grass. Nerved-manna-grass. Fowl Meadow-grass. Meadow Spear-grass. Fowl-grass.

Stems 3-9 dm. tall, erect or decumbent at base, smooth; sheaths closed almost to the summit; blades flat, 3 dm. long or less; panicle 1-2 dm. long, open, nodding, branches slender, flexuous, spreading or drooping; spikelets 3-7 flowered, 2-3 mm. long; glumes 1-nerved, second 1 mm. long; lemma 1.5 mm. long, 7-nerved.

Distribution: Found throughout most of North America. **Oklahoma:** Tahlequah, Prier.

Remarks: This plant is found on moist soils. It furnishes some grazing where it is abundant enough. Summer and fall.

Fig. 103. *Glyceria striata*

FESTUCA L.

Annual or perennial grasses of varied habits with closed or open panicles; spikelets few to several flowered, rachilla articulating above the glumes and between the florets; glumes unequal, narrow, acute; lemmas rounded on the back, 1-5 nerved, nerves often obscure, awned from the tip or rarely from a minutely 2-toothed apex.

- | | | |
|--|-------|------------------------|
| 1. Annuals | ----- | 2 |
| Perennials | ----- | 3 |
| 2. Awn not longer than lemma; spikelets 5-many | ----- | 1. <i>F. octoflora</i> |
| Awn about twice as long as lemma; spikelets 2-5 flowered | ----- | 2. <i>F. sciurea</i> |
| 3. Lemmas 5-7 mm. long; spikelets 5-10 flowered | ----- | 4 |
| Lemmas 4 mm. long or less; spikelets 3-6 flowered | ----- | 3. <i>F. shortii</i> |
| 4. Spikelets lanceolate, 5-9 flowered | ----- | 4. <i>F. elatior</i> |
| Spikelets ovate-lanceolate, 3-5 flowered | ----- | 5. <i>F. versuta</i> |



Fig. 104. *Festuca octoflora*

***Festuca octoflora* Walt.** Slender Fescue-grass. Six-weeks Fescue.

Stems 1-5 dm. tall, erect, slender, simple and smooth; sheaths usually shorter than the internodes; blades 4-8 cm. long, conduplicate; raceme-like panicles often secund, 2.5-15 cm. long, branches erect or ascending; spikelets 5-13 flowered, 5-12 mm. long; first glume 1-nerved, 3 mm. long, second 3-nerved, 4 mm. long; lemma obscurely 5-nerved, 4-5 mm. long, awn 1-7 mm. long.

Distribution: Quebec to British Columbia south to Florida, Texas and California. **Oklahoma:** Alva, Stevens; Arbuckle Mts., Featherly; Caddo Co., Stevens; Ellis Co., Clifton; Fort Sill, English; Hinton, Stevens; Madison, Menter; Muskogee Co., Little; Norman, Prier; Norman, Jeffs; Osage Co., Stevens; Oklahoma Co., Stemen & Myers; Ripley, Featherly; Stillwater, Stratton; Osage Co., Penn.

Remarks: This species is found on dry soil. It is of little economic importance. Summer.

2. ***Festuca sciurea* Nutt.** Southern Fescue-grass. Squirrel Fescue.

Stems 1-4 dm. tall, slender; sheaths shorter than internodes, blades 6 cm. long or less, very narrow; panicle slender, secund, 0.5-1.5 dm. long, branches erect or appressed; spikelets 3-5 flowered, first glume about half as long as second; lemmas appressed-pubescent, 3 mm. long, awn 5-9 mm. long.

Distribution: Virginia to Florida, Oklahoma, and Texas. **Oklahoma:** Norman, Prier; Oklahoma City, Stemen & Myers; Ripley, Featherly; Stillwater, Stratton.

Remarks: This species is found on dry soil. It is of no economic importance. Spring and summer.

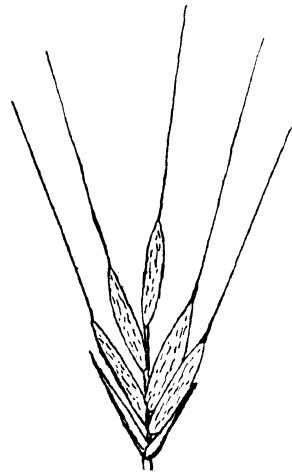


Fig. 105. *Festuca sciurea*

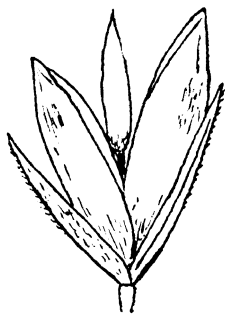


Fig. 106. *Festuca shortii*

3. *Festuca shortii* Kunth. Short's Fescue-grass.

Stems 6-12 dm. tall, simple, smooth; sheaths shorter than the internodes; blades 1.5-2.5 dm. long, 2-6 mm. wide, flat, conduplicate; panicle 0.5-2 dm. long, branches spreading or ascending; spikelets broadly ovate, 3-6 flowered, 5-6 mm. long; glumes narrow, unequal, scabrous, first glume 1-3 nerved, second 3-nerved; lemma about 4 mm. long.

Distribution: Pennsylvania to Iowa, south to Georgia and Texas. **Oklahoma:** Muskogee Co., Little.

Remarks: This species is found in woods and thickets. It is of no economic importance.

4. *Festuca elatior* L. Tall Fescue-grass. Meadow Fescue-grass.

Stems 6-15 dm. tall, erect or geniculate at base, simple, smooth; sheaths shorter than the internodes; blades flat, smooth beneath, rough above; panicle 1-3.5 dm. long, often nodding, branches erect or ascending; spikelets 5-9 flowered, 9-12 mm. long; glumes subequal, first 1-nerved, second 3-nerved; lemmas smooth, 5-6 mm. long, 5-nerved.

Distribution: Found throughout the United States. **Oklahoma:** Fort Sill, English; Norman, Prier.

Remarks: This species is found in fields and waste places. It is of little or no economic importance. Summer.

5. *Festuca versuta* Beal. Texas Fescue-grass.

Stems 6-8 dm. tall, simple, erect; sheaths usually smooth; blades flat, 5 dm. long or less, 2-4 mm. wide; panicle open, branches few; branches spikelet-bearing on outer half; spikelets ovate-lanceolate, 8-10 mm. long, 3-5 flowered; glumes subequal, first shorter, 1-nerved, second 3-nerved; lemma about 6 mm. long, nerves obscure, hyaline at the apex.

Distribution: Oklahoma to Texas **Oklahoma:** Wichita Mts., Featherly.

Remarks: This species is found in moist shady places. It is of no economic importance. Spring and summer.

CENCHRUS L.

Annuals or perennials, usually low branching grasses with a spicate inflorescence; the spikelets are enclosed in a spiny involucre (burr), this deciduous with the spikelets at maturity.



Fig. 107. *Cenchrus pauciflorus*

Cenchrus pauciflorus Benth. Sand Bur. Bur-grass.

Annual; stems 2-6 dm. long, at first erect, later prostrate or decumbent; sheaths compressed, glabrous with ciliate margins, blades flat, smooth or rough; spikes 2.5-8 cm. long; involucre (burrs) 6-20, about 5 mm. broad excluding the spines, pubescent with short hairs, spines 3-4 mm. long; spikelets 6-7 mm. long.

Distribution: Found throughout the United States. **Oklahoma:** Alfalfa Co., Stevens; Fort Sill, English; Harmon Co., Stevens; Hellen, Naylor; Muskogee, Little; Muskogee Co., Pammel; Norman, Prier; Norman, Perkinson; Norman, Bruner; Oklahoma City, Stemen & Myers; Stillwater, Featherly; Stillwater, Stratton; Woods Co., Stevens; Woodward, Littrell; Osage Co., Penn.

Remarks: This plant is a serious pest due to the burrs which cause mechanical injury to animals. Summer and fall.

SETARIA Beauv.

(*Chaetochloa* Scribn.)

Annual or sometimes perennial grasses with narrow, terminal, spike-like panicles; spikelets with one to many awn-like bristles attached below the plane of articulation, 1-flowered.

- | | |
|-------------------------------|-------------------------|
| 1. Perennial | 1. <i>S. geniculata</i> |
| Annual | 2 |
| 2. Bristles 5 or more | 2. <i>S. lutescens</i> |
| Bristles 1-3 | 3 |
| 3. Spikelets 2 mm. long | 3. <i>S. viridis</i> |
| Spikelets 3 mm. long | 4. <i>S. italica</i> |

1. *Setaria geniculata* (Lam.) Beauv. (*S. imberbis* Roem. & Schult.) Perennial Foxtail.

Stems 3-9 dm. tall, slender, simple or branched below from a branching rootstock; sheaths compressed, overlapping; blades 3 dm. long or less, often involute; panicle 2.5-8 cm. long, cylindrical, spike-like; bristles 8-12 mm. long; spikelets 2.5-3 mm. long; first glume 3-nerved, one-half as long as the spikelet; second glume 3-5 nerved; fertile lemma transversely rugose.

Distribution: Massachusetts to Kansas, south to Florida and Texas. **Oklahoma:** Cleveland Co., Prier; Fort Sill, English; Granite, Stevens; Muskogee Co., Little; Oklahoma Co., Stemen & Myers; Osage Co., Penn.

Remarks: This species is found on moist soil. It is of but little economic importance. Spring to fall.

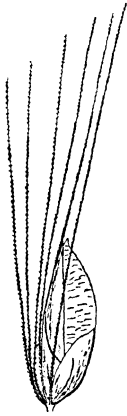


Fig. 108. *Setaria lutescens*

2. *Setaria lutescens* (Weigel.) F. T. Hubb. (*S. glauca* Beauv.) (*Cheatochloa glauca* Scribn.) Yellow Foxtail. Pigeon-grass.

Stems 3-12 dm. tall, erect or decumbent at the base; branched; sheaths loose, glabrous; blades smooth or scabrous, flat; panicle cylindrical, 2.5-10 cm. long; spikelets 2.5-3 mm. long, oval; bristles 2-4 times as long as the spikelets; glumes unequal, shorter than the lemma; fertile lemma transversely rugose, convex.

Distribution: Found throughout the United States and southern Canada. **Oklahoma:** Cleveland Co., Prier; Fort Sill, English; Guthrie, Dobson; Kay Co., Stevens; Muskogee Co., Little; Muskogee Co., Pammel; Norman, Stemen & Myers; Ottawa Co., Stevens; Stillwater, Featherly; Stillwater, Stratton; Claremore, Brunkow; Osage Co., Penn; Pushmataha Co., Barclay.

Remarks: This species is a weed in cultivated ground and waste places. Summer and fall.

3. *Setaria viridis* (L.) Beauv. (*Chaetochloa viridis* (L.) Scribn.) Green Foxtail. Wild Millet. Pigeon-grass. Green Bottle-grass.

Stems erect or ascending, 3-9 dm. tall, simple or branched; margins of sheaths ciliate; blades wide, scabrous above; panicles cylindrical, spike-like, 2.5-10 cm. long; spikelets about 2 mm. long; first glume less than half as long as spikelet, fertile lemma faintly transversely rugose.

Distribution: Throughout the United States and southern Canada. **Oklahoma:** Blaine Co., Stevens; Logan Co., Stevens; Muskogee Co., Little; Noble, Jeffs; Norman, Prier; Norman, Bruner; Oklahoma Co., Stemen & Myers; Tonkawa, Stevens; Woods Co., Stevens; Osage Co., Penn.

Remarks: This species is a weed in cultivated ground and waste places. Summer and fall.



Fig. 109. *Setaria viridis*



Fig. 110. *Setaria italica*
(U. S. D. A. Div. Agros.)

4. *Setaria italica* (L.) Beauv. (*Chaetochloa italica* (L.) Scribn.) Common Millet. Foxtail Millet.

Stems 9-15 dm. tall, smooth, stout, branched; sheaths smooth or scabrous; blades flat, rough, broad; panicles 1-2.5 dm. long, 1-5 cm. thick, cylindrical, robust, nodding, often compound; spikelets 3 mm. long, bristles 1-3; first glume one-third the length of the spikelets, 3-nerved; second three-fourths as long as the spikelet, fertile lemma as long as or longer than the second glume, finely transversely-rugose.

Distribution: Quebec to Minnesota southward to Florida and Texas.

Remarks: This is cultivated for forage and chicken feed. It has escaped from cultivation and is found as a weed in waste places in some sections. Summer and fall.

4a. *Setaria italica* var. *stramineo-fructa* Bailey. Fruit yellow; bristles variously colored. German Millet. Golden Wonder Millet.

4b. *Setaria italica* var. *rubro-fructa* Bailey. Fruit reddish or orange; bristles purple. Siberian Millet. Turkestan Millet.

4c. *Setaria italica* var. *nigro-fructa* Bailey. Fruit purplish, almost black; bristles dark brown. Hungarian Millet.

ECHINOCHLOA Beauv.

Annual or perennial coarse grasses with compressed sheaths, flat blades and terminal, compact, rough panicles of secund racemes; spikelets 1-2 flowered; the glumes and sterile lemma hispid on the nerves, the second glumes and sterile lemma awned or awn-pointed.

- 1. Awn of sterile lemma 4 times as long as spikelet or less 2
Awn of sterile lemma 8 or more times as long as spikelet 1. E. walteri
- 2. Racemes simple, rather distant, 1-2 cm. long 2. E. colonum
Racemes more or less branched, 2 cm. long or more 3. E. crus-galli

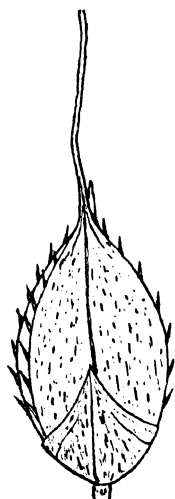


Fig. 111. *Echinochloa walteri*

1. *Echinochloa walteri* (Pursh) Heller.
(*E. longearistata* Nash.) Long-awned Barn-
yard-grass.

Stems 10-20 dm. tall, erect; sheaths glabrous; blades 10-30 mm. wide, scabrous above; panicles large, dense, erect or nodding, axis scabrous, more or less papillose-hispid in the angles; branches appressed or ascending, 10 cm. long or less; spikelets closely arranged, several on short branches or raceme, mostly long-awned, often purple, about 3 mm. long; awn usually 1-2 cm. long or more; fruit about 3 mm. long and 1 mm. wide.

Distribution: South Carolina to Louisiana and Oklahoma. **Oklahoma:** Cleveland Co.. Jeffs.

Remarks: This species is found on moist soil. It is not common in Oklahoma. Summer.

2. *Echinochloa colonum* (L.) Link Jungle Rice.

Stems 3-6 dm. tall, erect or decumbent and rooting at the lower nodes; sheaths smooth compressed; blades acuminate, smooth or rough; panicle composed of 3-18 secund racemes; spikelets in two rows, hispid on the nerves, 2.5-3 mm. long.

Distribution: Virginia, Florida, Texas, Oklahoma and Mexico. **Oklahoma:** Woods Co., Stevens.

Remarks: This species is found in fields and roadsides. It is not common in Oklahoma. Spring to fall.

3. *Echinochloa crus-galli* (L.) Beauv.
Barnyard-grass. Barn-grass. Water-grass.
Cockspur-grass.

Annual, stems 3-12 dm. tall, erect or decumbent, branching; sheaths loose, glabrous; blades smooth beneath, margins rough; panicles of 5-15 branches, ascending or spreading; spikelets about 4 mm. long exclusive of awn, crowded.

Distribution: Found throughout temperate North America. **Oklahoma:** Blaine Co., Stevens; Burbank, Featherly; Fort Sill, English; Jackson Co., Stevens; Muskogee Co., Little; Muskogee Co., Pammel; Norman, Jeffs; Norman, Prier; Oklahoma Co., Stemen & Myers; Ottawa Co., Stevens; Stillwater, Stratton; Watonga, Graff; Osage Co., Penn.

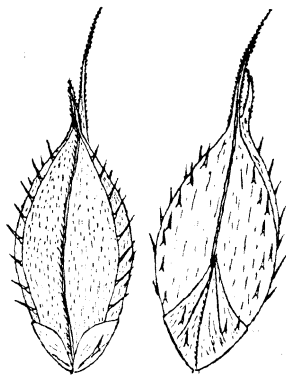


Fig. 112. *Echinochloa crus-galli*

Remarks: This plant is found on moist soils in cultivated fields and waste places. This is a coarse grass but is grazed when young. Summer and fall.

3a. *Echinochloa crus-galli* var. *frumentacea* (Roxb.) Wight. Japanese Barnyard Millet. Billion Dollar grass

Panicles compact, branches ascending, often incurved; spikelets almost as broad as long, turgid, nerves hispid, not tuberculate.

3b. *Echinochloa crus-galli* var. *mitis* (Pursh) Peterm.

Stems tufted, 5-15 cm. long, prostrate or ascending; sheaths overlapping; keeled; blades smooth; panicles usually closed, included at the base.

DIGITARIA Heister.

(*Syntherisma* Walt.)

Usually annuals; slender erect or prostrate grasses with slender, secund racemes digitate or approximate at the top of the stem; spikelets in 2's or 3's on a winged or wingless triangular rachis, sterile lemma below the fertile floret.

- 1. Rachis of the raceme wingless 2
Rachis of the racemes with lateral angles broadly winged 3
- 2. Racemes 2.5-10 cm. long; spikelets 2 mm. long or less 1. *D. filiformis*
Racemes 10 or more cm. long; spikelets over 2 mm. long 2. *D. villosa*
- 3. Spikelets 3 mm. long; pedicels angular 3. *D. sanguinalis*
Spikelets 2 mm. long; pedicels terete 4. *D. ischaemum*

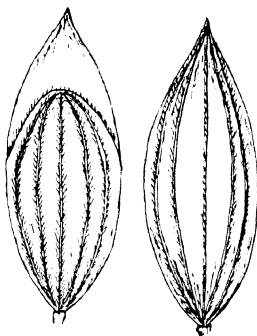


Fig. 113. *Digitaria filiformis*

1. *Digitaria filiformis* (L.) Koel. (*Syntherisma filiforme* (L.) Nash.) Slender Finger-grass. Wire-grass.

Stems 3-12 dm. tall, erect, slender, smooth, terminating in a raceme; sheaths hairy, blades erect, smooth or hirsute above near the base; racemes 2-5, filiform, 3-10 cm. long, approximate near the summit of the stem, ascending; rachis 3-angled; spikelets in pairs (sometimes 3's), pubescent, about 2 mm. long; first glume usually absent, second three-fourths as long as the lemma; lemma and palea equal.

Distribution: New Hampshire to Michigan, southward to Oklahoma and North Carolina. **Oklahoma:** Muskogee Co., Little; Skiatook, Featherly; Osage Co., Penn.

Remarks: This species is found on dry sandy soil. It is of no economic importance. Summer and fall

2. *Digitaria villosa* (Walt.) Pers. Southern Slender Finger-grass.

Stems tufted, 4-12 dm. tall, slender, branched below; sheaths loose, longer than the internodes, the lower ones papillose-hirsute; blades 25 cm. long or less, 6 mm. or less wide, smooth below, rough above; racemes 3-6, 12-15 cm. long, erect or ascending; spikelets 2.5 mm. long, first glume absent, second glume and lemma appressed-pubescent.

Distribution: Illinois to Oklahoma south to Georgia and Texas. **Oklahoma:** Norman, Prier; Oklahoma Co., Stemen & Myers; Tulsa, De Yarmett; Osage Co., Penn.

Remarks: This species is found on dry sandy soils. It is of no economic importance. Summer.

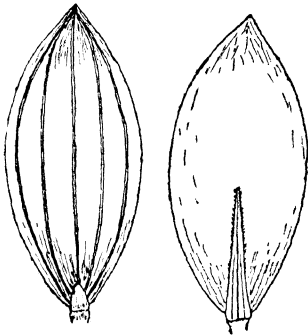


Fig. 114. *Digitaria sanguinalis*

3. *Digitaria sanguinalis* (L.) Scop. Crab-grass. Finger-grass.

Stems more or less tufted, 3-10 dm. tall, geniculate at the base, often rooting from lower nodes; sheaths loose papillose-hirsute; blades 15 cm. long or less, 4-11 mm. wide, rough to papillose-hirsute on both surfaces; racemes 3-12, 5-16 cm. long, ascending; spikelets 2.5-3 mm. long; first glume minute, second glume about half as long as the 7-nerved sterile lemma, sterile lemma as long as the spikelet, fertile lemma chartaceous.

Distribution: Found throughout most of North America. **Oklahoma:** Banner, Conner; Fort Sill, English; Muskogee Co., Little; Norman, Prier; Oklahoma Co., Stemen & Myers; Ottawa, Stevens; Stillwater, Stratton; Stillwater, Featherly; Washita Co., Stevens; Wewoka, Sullivan; Woods Co., Stevens; Nardin, Smith; Osage Co., Penn.

Remarks: This species is a weed in cultivated fields and gardens. Spring, summer and fall.

4. *Digitaria ischaemum* (Schreb.) Muhl. (*Syntherisma humifusum* (Pers.) Rydb.) Crab-grass. Finger-grass.

Stems 2-5 dm. tall, branched; sheaths glabrous; blades 12 mm. long or less, erect smooth; racemes 2-5, 8 mm. long or less, spreading; spikelets about 2 mm. long, in pairs; first glume usually absent, second glume pubescent, as long as the 7-nerved sterile lemma, sterile lemma somewhat shorter than the fertile one.

Distribution: Ontario to Louisiana and Florida. **Oklahoma:** Muskogee Co., Little; Osage Co., Penn.

Remarks: This species is found in fields and waste places. It is of no economic importance. Summer.

LEPTOLOMA Chase

Perennial grasses; stems tufted; blades flat; panicles open, branches diffuse, spikelets with sterile lemma below fertile floret; the first glumes minute or absent, the second glume 3-nerved and as long as the spikelet.

Leptoloma cognatum (Schultes) Chase. Diffuse Crab-grass.

Stems tufted 2-7 dm. tall, slender, branched; sheaths usually loose, the lower ones pubescent; blades 12 cm. long or less and 3-5 mm. wide; panicle diffuse, broader than long at maturity, included at the base before maturity, bearded in the axils; spikelets solitary, lanceolate, about 3 mm. long, borne on long slender pedicels; first glume minute, the second as long as the spikelet; the second glume and sterile lemma enclosing the fertile floret.

Distribution: New Hampshire to Arizona and from Minnesota to Florida. **Oklahoma:** Fort Sill, English; Hominy, Featherly; Major Co., Stevens; Norman, Prier; Stillwater, Featherly; Wichita Mts., Featherly; Claremore, Brunkow; Osage Co., Penn.

Remarks: This plant is found on dry soils. It is palatable but not abundant enough to be of any importance. Summer and fall.



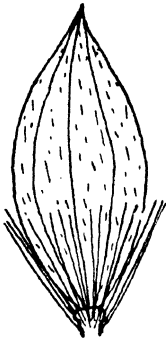
Fig. 115. *Leptoloma cognatum*
(U. S. D. A. Div. Agros.)

ERIOCHLOA H. B. K.

Perennial plants of medium height with flat blades and paniculate inflorescence of second spike-like racemes; spikelets one-flowered with an annular callus at the base; articulation below the callus.

Apex of pedicels with hairs half the length of the spikelets 1. *E. sericea*

Apex of pedicels with hairs less than half the length of spikelets 2. *E. contracta*

Fig. 116. *Eriochloa sericea*

1. *Eriochloa sericea* Monro.

Stems 3-10 dm. tall, erect, pubescent at the nodes; sheaths pubescent, especially the lower ones; blades 1-3 dm. long, conduplicate, pubescent; racemes secund, erect; spikelets appressed, 4-5 mm. long, pubescent, on a pedicel with an enlarged apex from which arise ascending hairs half the length of the spikelet.

Distribution: Texas, Oklahoma, and New Mexico. **Oklahoma:** Davis, Emig.

Remarks: This species is not common in Oklahoma. Summer.

2. *Eriochloa contracta* Hitchc. Dotted Millet.

Stems tufted, 6 dm. tall or less, erect or decumbent at the base, pubescent; sheaths thin, loose, pubescent; blades flat, pubescent, 1 dm. long or less; panicle slender, branches erect, bearing spike-like secund racemes; spikelets appressed, 4-5 mm. long, elliptical, pubescent with ascending hairs.

Distribution: Southern part of the United States. **Oklahoma:** Altus, Stevens; Fort Sill, English; Lamont, Stevens; Norman, Prier; Oklahoma Co., Stemen & Myers; Ponca, Stevens; Stillwater, Featherly; Three Sands, Daane; Oakwood, Price; Osage Co., Penn.

Remarks: This plant is found in fields and waste places. Spring, summer and fall.

Fig. 117. *Eriochloa contracta*

BRACHIARIA (Trin.) Griseb.

Annuals or perennials; stems branching and spreading; spikelets single (rarely in pairs), subsessile, in two rows on one side of a 3-angled rachis; first glume turned toward the rachis; second glume and sterile lemma about equal, the lemma enclosing a hyaline palea and sometimes a staminate flower; fertile lemma indurate, usually papillose rugose.

Brachiaria extensa Chase.

Annual; stems decumbent, rooting at the nodes; blades rather short and wide; panicle of racemes short exerted or included at base; racemes 2-6, distant ascending or spreading, rachis winged; spikelets ovate, 4-4.5 mm. long, about 2 mm. wide; first glume about one-third the length of the spikelet; second glume and sterile lemma about equal; fruit about 3 mm. long, elliptic, papillose-roughened.

Distribution: Florida, southern Louisiana, Texas and Oklahoma.
Oklahoma: Payne Co., Penn; Payne Co., Ramming.

Remarks: Found on moist sandy soil. Rare in Oklahoma.

AXONOPUS Beauv.

Spikelets oblong, obtuse, solitary, in two rows on one side of a 3-angled rachis; back of fertile lemma turned away from the axis; first glume absent; second glume and sterile lemma equal.

Axonopus compressus (Swartz) Beauv. Carpet-grass.

Plants stoloniferous, blades of stolons often broader and shorter than those of the stem; flowering stems slender, compressed, erect or ascending, 20-60 cm. tall, terminal or axillary, long exerted; racemes usually 3, two at the summit and one (sometimes 2) lower; spikelets about 2 mm. long.

Distribution: Coastal Plain, North Carolina, Florida and Texas, also Arkansas and Oklahoma. **Oklahoma:** Apache, Ellithorp.

PASPALUM L.

Usually perennials with 1-many spike-like racemes arranged singly or in pairs (seldom more than 2 in a place) at the end of the stem, or raceme-like along the central axis; spikelets plano-convex, single or in pairs in two rows on one side of a slender rachis.

- | | |
|--|----------------------------|
| 1. Rachis foliaceous, broad and winged, extending beyond the terminal spikelet | 1. <i>P. repens</i> |
| Rachis not foliaceous or winged | 2 |
| 2. Racemes 2, together or nearly so at the summit of the stem | 2. <i>P. distichum</i> |
| Racemes 1-many on the axis, not together | 3 |
| 3. First glume developed on at least one spikelet of the pair; spikelets turgidly biconvex | 3. <i>P. bifidum</i> |
| First glume normally absent | 4 |
| 4. Racemes terminal and axillary, sometimes hidden in sheath | 5 |
| Racemes terminal on primary stem or leafy branches | 7 |
| 5. Foliage, except margins, glabrous or nearly so | 4. <i>P. ciliatifolium</i> |
| Foliage conspicuously pubescent (or sparsely so in exceptional specimens) | 6 |

- 6. Blades from sparsely to rather densely pilose, rather thin 5. *P. pubescens*
 Blades puberulent on both surfaces with long hairs, rather firm 6. *P. stramineum*
- 7. Spikelets conspicuously silky-ciliate around the margins 7. *P. dilatatum*
 Spikelets not ciliate 8
- 8. Plants robust, 1-2 m. tall; spikelets about 4 mm. long 8. *P. floridanum*
 Plants not robust, if more than 1 m. tall, relatively slender; spikelets less than 4 mm. long 9
- 9. Spikelets suborbicular or broadly obovate or broadly oval 10
 Spikelets obovate; stems stout, decumbent, rooting at lower nodes 9. *P. pubiflorum*
- 10. Spikelets orbicular, scarcely one-third as thick as broad 10. *P. circulare*
 Spikelets longer than broad, more than one-third as thick as broad 11. *P. laeve*

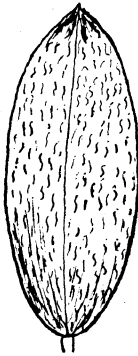


Fig. 118. *Paspalum repens*

1. *Paspalum repens* Borg. (*P. mucronatum* Muhl.) Water Paspalum.

Stems 2-3 dm. long, weak, decumbent, rooting at lower nodes, glabrous, pubescent at nodes; sheaths very loose, longer than internodes, glabrous; blades 5-12 cm. long, often more than 1 cm. wide, thin; racemes 15 or more; spikelets about 1.5 mm. long, elliptical, in two rows on a very broad, flat rachis.

Distribution: South Carolina to Indiana and Kansas, south to Florida and Texas.
Oklahoma: Comanche Co., Stevens; Muskogee Co., Little; Osage Co., Stevens; Tahlequah, Prier.

Remarks: Found in sluggish streams, standing water, or wet soils. It is of no economic importance. Summer and fall.

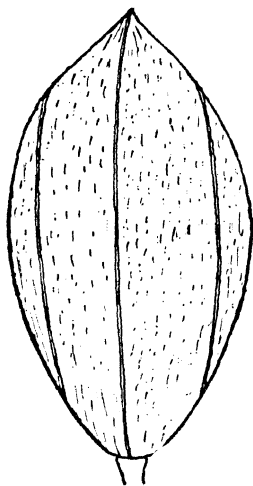


Fig. 119. *Paspalum distichum*

2. *Paspalum distichum* L. Joint-grass. Knot-grass. Devil's-grass. Seaside Millet.

Stems 1.5-6 dm. tall, from a running rootstock, slender, pubescent at the nodes; sheaths more or less glabrous, ciliate on margins; blades 1 dm. long or less, glabrous; racemes 2, erect or ascending, one terminal, the other lateral and immediately below; spikelets elliptical, about 2.5 mm. long, in two rows, very finely pubescent.

Distribution: New Jersey to Florida, Tennessee and Arkansas, west to California and Washington. **Oklahoma:** Carney, Rogers; Fort Sill, English; Harmon Co., Stevens; Norman, Prier.

Remarks: This species is found along ditches and wet places. It is of little economic importance.

3. *Paspalum bifidum* (Bertol.) Nash.

Stems erect, simple from short scaly rhizomes 5-12 dm. tall; sheaths loose, longer than the internodes, villous; blades 1-5 dm. long and 3-14 mm. wide, more or less villous; racemes 3 or 4, 4-16 cm. long, at first erect; rachis slender; spikelets 3.3-4 mm. long, irregularly arranged on rachis, nerves prominent.

Distribution: Coastal Plain from South Carolina to Texas and Oklahoma. **Oklahoma:** Tishomingo, Palmer.

Remarks: Very rare in the state.

4. *Paspalum ciliatifolium* Michx.

Stems erect or spreading, 4-9 dm tall; sheaths glabrous or the lower ones puberulent; blades 10-35 cm. long and 7-10 mm. wide, ciliate on the margins; racemes 1-3; spikelets about 2 mm. long, more or less orbicular; glumes more or less pubescent.

Distribution: New Jersey to Oklahoma southward to Florida and Texas. **Oklahoma:** Muskogee Co., Little.

Remarks: This plant is quite variable; even the leaves and spikelets of a single plant are variable.

5. *Paspalum pubescens* Muhl.

Stems ascending, 4-9 dm. tall; sheaths pilose toward the summit; blades 8-20 cm. long, 2-10 mm. wide, pilose on both sides; racemes 1-3; spikelets about 2 mm. long, more or less orbicular, glabrous.

Distribution: Vermont to Michigan, south to Florida and Texas. **Oklahoma:** McCurtain Co., Little & Olmsted; Osage Co., Penn.

Remarks: Found usually on sandy soil in old fields and pastures.

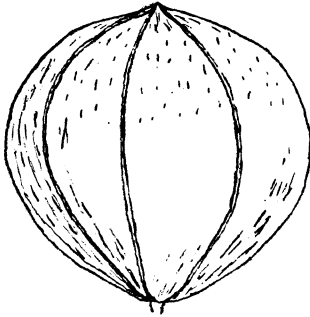


Fig. 120. *Paspalum stramineum*

Featherly; Stillwater, Kiltz; Stillwater, Featherly; Wister, Hitchcock; Wichita Mts., Swallen; Woods Co., Stevens; Osage Co., Penn.

Remarks: This species is found on sandy soils. It furnishes some grazing. Summer and fall.

7. *Paspalum dilatatum* Poir. Dallis-grass.

Stems tufted, leafy at the base, 5-15 dm. tall, erect or ascending; blades 10-25 cm. long, 3-12 cm. wide; racemes 3-5, 6-8 cm. long; spikelets 3-3.5 mm. long, ovate, pointed, edged with long white hairs and sparsely hairy on the surface.

Distribution: New Jersey to Oklahoma southward to Florida and Texas. Also in Oregon, California and Arizona. **Oklahoma:** Payne Co., Featherly.

Remarks: This is a valuable forage plant and is grown quite extensively in the southern part of the state. It was introduced from South America.

6. *Paspalum stramineum* Nash. *P. bushii* Nash. Straw-colored Paspalum.

Stems 2-8 dm. tall, erect, slender, glabrous; lower sheaths densely pubescent, overlapping, the upper sheaths pubescent or glabrous; blades 1-2 dm. long, ciliate on margins, pubescent above and usually below; racemes 1-3, usually 2 on main stem and one on the branches; spikelets in pairs, orbicular, about 2 mm. in diameter.

Distribution: Indiana to Minnesota, Texas and New Mexico. **Oklahoma:** Blaine Co., Stevens; Fort Sill, English; Harper Co., Stevens; Hominy, Featherly; Norman, Jeffs; Norman, Prier; Perkins, Featherly; Skiatook, Featherly; Stillwater, Kiltz; Stillwater, Featherly; Wister, Hitchcock; Wichita Mts., Swallen; Woods Co., Stevens; Osage Co., Penn.

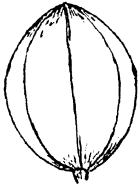


Fig. 121. *Paspalum floridanum*

8. *Paspalum floridanum* Michx. Florida Paspalum.

Stems 1-2 m. tall from a scaly rootstock, glabrous; sheaths more or less glabrous, ciliate on the margins, lower ones longer than the internodes; blades 1.5-3.5 dm. long; racemes 2-6, erect or ascending; spikelets single or in pairs, 3.5-4.5 mm. long, glabrous.

Distribution: South Carolina to Oklahoma southward. **Oklahoma:** Muskogee Co., Little; Norman, Stemen & Myers; Ottawa Co., Stevens; Stillwater, Featherly; Stillwater, Kiltz; Osage Co., Penn; Pushmataha Co., Barclay.

Remarks: This plant is found on moist places. It furnishes some grazing when young. Summer and fall.

9. *Paspalum pubiflorum glabrum* Vasey.
(*P. laeviglume* Scribn. *P. geminum* Nash.)

Stems 0.5-1 m. tall, ascending, pubescent at nodes, glabrous, decumbent or geniculate at base, often rooting from lower nodes; sheaths loose, ciliate on margins, lower ones papillose-hirsute; blades 1-3 dm. long, ciliate on margins near base; racemes 3-10, dense, divergent; spikelets in pairs, about 3 mm. long, glabrous.

Distribution: North Carolina to Kentucky and Florida, west to Kansas and Texas. **Oklahoma:** Fort Sill, English; Norman, Prier; Stillwater, Featherly; Tulsa, De Yarmett; Muskogee Co., Little; Osage Co., Penn.

Remarks: This species is found in low moist soils where it furnishes some grazing. Summer and fall.

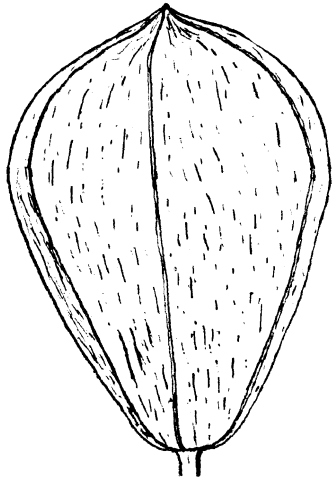


Fig. 122. *Paspalum pubiflorum glabrum*

10. *Paspalum circulare* Nash.

Stems in dense leafy clumps, 3-8 dm. tall; blades mostly erect, usually about equaling the inflorescence, 15-30 cm. long and 5-10 mm. wide, usually pilose on the upper surface; racemes 2-7, ascending to almost erect, 5-12 cm. long; spikelets orbicular, about 3 mm. long, glabrous.

Distribution: Connecticut to North Carolina west to Kansas and south to Texas, Louisiana and Mississippi. **Oklahoma:** McCurtain Co., Little & Olmsted.

Remarks: Not abundant enough to be of value in Oklahoma.

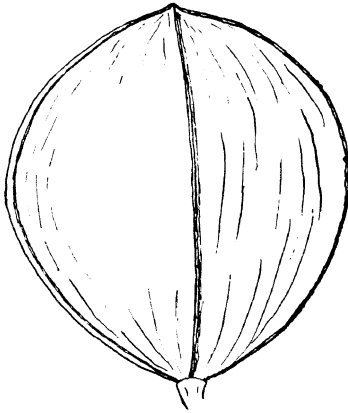


Fig. 123. *Paspalum laeve*

11. *Paspalum laeve* Michx.

Stems erect or ascending, 4-10 dm. tall, leafy at the base; sheaths keeled; blades usually folded at the base, sometimes folded above, 5-30 cm. long, 3-10 mm. wide; racemes 3 or 4, spreading; spikelets broadly oval, 2.5-3 mm. long, glabrous.

Distribution: New Jersey to Oklahoma, south to Florida and Texas. **Oklahoma:** Muskogee Co., Little.

SACCIOLEPIS Nash.

Annual or perennial grasses with flat blades and long contracted spike-like panicles; spikelets oblong-conic, first glume small, shorter than the spikelet, second broad, inflated-saccate, strongly nerved; palea not inclosed at the summit.

Sacciolepis striata (L.) Nash. Gibbous Panic-grass.

Stems 3-20 dm. tall, glabrous, branched below; lower sheaths hirsute, upper one glabrous, strongly striated; blades 1-2 dm. long, 4-15 mm. wide, acuminate; panicle slender, spike-like, branches appressed, spikelets horizontal, about 3.5 mm. long; first glume about one-fourth as long as spikelet, second glume as long as spikelet and gibbous at the base.

Distribution: Virginia to Oklahoma southward. **Oklahoma:** Sapulpa, Burch.

Remarks: This plant is not abundant enough in Oklahoma to be of any economic importance. Summer and fall.

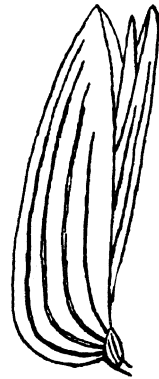


Fig. 124. *Sacciolepis striata*

PANICUM L.

Annual or perennial grasses which are quite variable, with flat and usually broad blades and with the spikelets arranged in open or contracted panicles, rarely in racemes; spikelets 1-2 flowered, if 2-flowered the lower staminate; glumes unequal, the first often minute; first lemma, if present, sterile or sometimes staminate; second lemma chartaceous-indurate, glabrous, shining, nerves obsolete, inclosing a palea of the same texture and a perfect flower.

1. Basal leaves usually distinctly different from those of the stem, forming a winter rosette; stems at first simple, spikelets of primary panicle not perfecting seed, the small secondary panicles with fertile cleistogamous spikelets 2
Basal leaves similar to stem leaves, no winter rosettes; spikelets all fertile 25
2. Blades elongate, 5 mm. wide or less; autumn-phase branching from base only 3
Blades not elongate (or if so, more than 5 mm. wide and autumnal phase not branching from base) 4
3. Spikelets about 3.5 mm. long, beaked 1. *P. depauperatum*
Spikelets less than 3 mm. long 2. *P. linearifolium*
4. Plants branching from the base, blades ciliate; sheaths retrorsely pilose 3. *P. xalapense*
Plants branching from the stem nodes or rarely remaining simple 5
5. Spikelets turgid, blunt, strongly nerved (not strongly turgid in *P. oligosanthos*); spikelets 3-4 mm. long 6
Spikelets not turgid, blunt, nor strongly nerved 9
6. Nodes bearded; blades velvety-pubescent beneath 7
Nodes not bearded; blades not velvety 8
7. Plants lax, velvety soft throughout; spikelets about 3 mm. long 4. *P. malacophyllum*
Plants stiff, pubescence harsh; spikelets about 4 mm. long 5. *P. ravenelii*
8. Spikelets narrowly obovate, subacute; plants olivaceous, appressed-pubescent 6. *P. oligosanthos*
Spikelets broadly obovate, turgid, blunt; plants green; pubescence if present not appressed 7. *P. scribnerianum*
9. Ligule of conspicuous hairs, usually 3-5 mm. long 10
Ligule absent or nearly so 15
10. Sheaths glabrous or only the lowermost somewhat pubescent 8. *P. lindheimeri*
Sheaths strongly pubescent 11
11. Spikelets 2 mm. long or less 12
Spikelets 2.2-2.4 mm. long; pubescence on stems horizontally spreading 9. *P. villosissimum*
12. Plants grayish, velvety-pubescent; spikelets 1.8-1.9 mm. long 10. *P. lanuginosum*
Plants pubescent, often villous, but not velvety 13

13. Stems conspicuously pilose with long horizontally spreading hairs	11. <i>P. praecocius</i>
Stems variously pubescent, if pilose the hairs not long and horizontally spreading	14
14. Vernal blades glabrous or nearly so on upper surface; autumnal stems branching from middle nodes, forming mats	12. <i>P. tennesseense</i>
Vernal blades pubescent on upper surface, sometimes pilose near base and margins only; spikelets 1.6-1.8 mm. long; autumnal phase not decumbent, spreading	13. <i>P. huachucae</i>
15. Spikelets nearly spherical at maturity; blades glabrous, cordate	16
Spikelets usually obovate or elliptic	17
16. Stems spreading; blades obscurely nerved; panicle nearly as broad as long	14. <i>P. sphaerocarpon</i>
Stems erect or ascending; blades rather strongly nerved; panicle never more than two-thirds as broad as long	15. <i>P. polyanthes</i>
17. Blades of midstem elongate; stems usually tall, velvety-pubescent; spikelets abruptly pointed	16. <i>P. scoparium</i>
Blades of midstem not elongate	18
18. Blades cordate, 1-3 cm. wide; spikelets 2.7-4.5 mm. long	19
Blades not cordate, less than 1 cm. wide	22
19. Sheaths strongly papillose-hispid; spikelets about 2.7-3 mm. long	17. <i>P. clandestinum</i>
Sheaths glabrous or nearly so	20
20. Spikelets 4-4.5 mm. long	18. <i>P. boscii</i>
Spikelets 2.6-3 mm. long	21
21. Plants glaucous; basal leaves conspicuously ciliate	19. <i>P. mutabile</i>
Plants not glaucous; basal blades not ciliate, or at the base only	20. <i>P. commutatum</i>
22. Nodes, at least the lower, bearded	23
Nodes not bearded	24
23. Spikelets 1.5-1.6 mm. long	21. <i>P. microcarpon</i>
Spikelets 2 mm. long	22. <i>P. barbulatorum</i>
24. Autumnal phase erect, branched like a little tree; second glume shorter than fruit and sterile lemma	23. <i>P. dichotomum</i>
Autumnal phase top-heavy, reclining; second glume equaling fruit and sterile lemma	22. <i>P. barbulatorum</i>
25. Plants annual	26
Plants perennial	32
26. Inflorescence of several more or less secund spike-like racemes; spikelets 5-6 mm. long; fruit transversely rugose	24. <i>P. texanum</i>
Inflorescence a more or less diffuse panicle	27
27. First glume not more than one-fourth the length of the spikelet, truncate or triangular tipped	25. <i>P. dichotomiflorum</i>
First glume usually as much as half the length of the spikelet, acute or acuminate	28

28. Panicles drooping; spikelets 4.5-5 mm. long 26. *P. miliaceum*
 Panicles erect; spikelets not over 4 mm. long 29
29. Panicle more than half the length of entire plant 30
 Panicle not more than one-third the entire height of plant;
 spikelets 2 mm. long or less 27. *P. philadelphicum*
30. Panicle narrow; usually less than half as broad as long 28. *P. flexile*
 Panicle as broad as long 31
31. Fruit without scar at base 29. *P. capillare*
 Fruit with a lunate scar at base 30. *P. hillmani*
32. Spikelets short-pediceled along one side of the rachises,
 forming spikelike racemes 33
 Spikelets in open or sometimes contracted or congested panicles 34
33. First glume nearly equaling the sterile lemma; spikelets 3-3.8
 mm. long 31. *P. obtusum*
 First glume much shorter than sterile lemma; spikelets 2.2-2.4
 mm. long 32. *P. geminatum*
34. Sterile palea enlarged and indurate at maturity, expanding the
 spikelet 33. *P. hians*
 Sterile palea, if present, not enlarged 35
35. Plants with conspicuous creeping scaly rhizomes 36
 Plants without creeping scaly rhizomes; spikelets short pediceled,
 more or less secund along the nearly simple, panicle
 branches 34. *P. agrostoides*
36. Spikelets long-pediceled, not secund 35. *P. virgatum*
 Spikelets short-pediceled, more or less secund 36. *P. anceps*

1. *Panicum depauperatum* Muhl.

Stems erect, slender, stiff, somewhat in tufts; sheaths glabrous to papillose-hirsute, longer than the internodes; blades 4-18 cm. long, 2-5 mm. wide, flat to involute; panicle 4-8 cm. long, spring panicle shortly exserted, fall panicle included at base; spikelets 3-3.8 mm. long, elliptic, pointed, glabrous to sparingly pubescent; second glume and sterile lemma extending beyond the fruit.

Distribution: Nova Scotia to Minnesota south to Georgia and Texas. **Oklahoma:** Medicine Park, Soil Conservation Service, Comm. Kiltz; Le-Flore Co., Little & Olmsted.

Remarks: Found in open wood. It is of little value economically.

2. *Panicum linearifolium* Scribn.

Spring phase in dense tufts; stems slender erect, 2-4.5 dm. tall; sheaths papillose-pilose; blades erect, usually exceeding the panicles, 2-4 mm. wide; panicle long-exserted, 5-10 cm. long with flexuous, ascending branches; spikelets 2.2-2.7 mm. long, elliptic, sparsely pilose. In autumn reduced panicles hidden among basal leaves.

Distribution: Dry woodlands from Quebec to Minnesota, south to Georgia and Texas. **Oklahoma:** McCurtain Co., Little & Olmsted; Muskogee Co., Little; LeFlore Co., Demaree; Osage Co., Penn.

3. *Panicum xalapense* H. B. K.

Stems slender, 2-5 dm. tall, erect or geniculate at the base; nodes bearded with reflexed hairs; sheaths retrorsely pilose; blades 8-15 cm. long, 5-10 mm. wide, more or less pilose-ciliate; spikelets 1.9-2 mm. long, pilose.

Distribution: Maryland to Illinois and Oklahoma, south to Florida and Texas. **Oklahoma:** Payne Co., Osborn; McCurtain Co., Featherly; McCurtain Co., Little & Olmsted; Hartsborne, Clark.

Remarks: This species which is found principally in the wooded sections of southeastern United States is of little economic importance.

4. *Panicum malacophyllum* Nash. Soft-leaved Panic-grass.

Stems slender, 3-6 dm. tall, more or less geniculate at the base, papillose-pilose with soft reflexed hairs, nodes retrorsely bearded; sheaths loose, usually less densely pilose than the stem; blades rather thin, velvety on both sides, ciliate at least toward the base; panicle 3-7 cm. long, axis and branches hirsute; spikelets about 3 mm. long, elliptic-obovate, turgid, papillose-pilose; first glume one-third as long as spikelet; second glume and sterile lemma equal; fertile lemma 2.2 mm. long.

Distribution: Tennessee, Missouri, Arkansas, Oklahoma and Texas. **Oklahoma:** False Washita, Palmer; LeFlore, Stevens; Muskogee Co., Little; Norman, Prier; Stillwater, Stratton; Stillwater, Learn; Wister, Hitchcock.

Remarks: This species is found in sandy woods. It is of no economic importance. Spring and summer.

5. *Panicum ravenelii* Scribn. & Merr.

Plants 3-6 dm. tall, erect, simple in summer but branching above the middle in the fall; stems papillose-hirsute, with ascending hairs, strongly striated; sheaths shorter than the internodes, papillose-hirsute with ascending hairs, strongly striated; blades 6-15 cm. long, tapering at both ends, velvety-pubescent beneath, glabrous above, sometimes ciliate on the margin; panicle 5-12 cm. long and about as wide, usually included at base; spikelets about 4 mm. long, turgid, sparsely pubescent; first glume almost half as long as the spikelet.

Distribution: Virginia to Missouri and Oklahoma and southward. **Oklahoma:** Muskogee Co., Little.

Remarks: This species is found on sandy or gravelly soils. It is of no economic importance in Oklahoma. Summer and fall.

6. *Panicum oligosanthes* Schult. Few-flowered Panic-grass.

Stems tufted, erect, 3-8 dm. tall, villous, branched sparingly below and freely above; sheaths papillose-hispid, hairs ascending; blades stiffly ascending; panicle loosely flowered, open, branches ascending or spreading; spikelets 3-4 mm. long, sparsely hirsute, oblong-obovate; first glume about two-fifths as long as spikelet, acute; second glume shorter than sterile lemma; fertile lemma about 3 mm. long.

Distribution: New Jersey to Illinois and Oklahoma, south to Florida and Texas. **Oklahoma:** Ponca City, Featherly; Sapulpa, Bush.

Remarks: This species is usually found in moist woods. It is not abundant enough to be of any importance. Summer and fall.

7. *Panicum scribnerianum* Nash. Panic-grass.

Stems erect or ascending, 2-5 dm. tall, sparingly pubescent, simple or dichotomously branched above; sheaths papillose-hispid, strongly striate, margins ciliate; blades erect or ascending, ciliate at the base, glabrous above, appressed pubescent to glabrous below, panicle ovoid, 4-8 cm. long; spikelets 3.2-3.3 mm. long, ovate, turgid, sparsely pubescent to nearly glabrous; first glume one-third as long as spikelet; second glume and sterile lemma unequal, strongly nerved; fertile lemma 2.8-2.9 mm. long.

Distribution: Maine to British Columbia, south to Virginia, Texas and Arizona. **Oklahoma:** Alfalfa Co., Stevens; Flora, Bebb; Fort Sill, English; Limestone Gap, Butler; Major Co., Stevens; Muskogee Co., Little; Oklahoma Co., Stemen & Myers; Sapulpa, Bush; Stillwater, Stratton; Stillwater, Featherly; Walker, Bebb; Osage Co., Penn.

Remarks: This species is found on sandy soils or dry prairies. It is not abundant enough to be of importance. Summer.

8. *Panicum lindheimeri* Nash.

Plants 3-6 dm. tall, slender, wiry; stems tufted, simple at first, later much branched, glabrous or lower internodes pubescent; sheaths shorter than internodes, ciliate on the margins; ligule 3-4 mm. tall; blades 2-10 cm. long, stiff, papillose-ciliate on margin near the base, glabrous above, branch blades stiff, short tapering to the apex; primary panicles long exserted, 4-8 cm. long, open, branches spreading, secondary panicles short, much exceeded by the cluster of leaves; spikelets about 1.4 mm. long; first glume about one-fourth as long as spikelet.

Distribution: Found throughout the United States. **Oklahoma:** Comanche Co., Stevens; Muskogee Co., Little; Poteau, Hitchcock; Wichita Mts., Stemen & Myers.

Remarks: This species is found on thin sandy soil. It is of no economic importance in Oklahoma. Summer and fall.

10. *Panicum lanuginosum* Ell.

Vernal phase grayish olive-green, velvety-villous; stems usually in large clumps, 4 to 7 dm. tall, loose, spreading, often with a glabrous ring below the nodes; ligule 3 to 4 mm. long; blades somewhat incurved or spoon-shaped; panicle 6 to 12 cm. long; axis pubescent; spikelets 1.8 to 1.9 mm. long. Autumnal stems widely spreading or decumbent, branching freely from middle nodes, branches repeatedly branching, the ultimate branchlets forming a fan-shaped fascicle.

Distribution: Coastal plain, New Jersey to Florida and Texas and in Oklahoma. **Oklahoma:** Norman, Bruner; Muskogee Co., Little.

Remarks: Found in moist sandy woods. It is of little economic importance.

11. *Panicum praecocius* Hitchc. & Chase. Panic-grass.

Stems tufted, 1.5-2.5 dm. tall, erect at first but soon becoming geniculate at the base, branching early, densely pubescent with long weak hairs 3-4 mm. long; sheaths pubescent like the stems; ligule 3-4 mm. long; blades erect or ascending, margins parallel for two-thirds their length, hirsute with long hairs on both sides; panicles 4-6 cm. long and about as wide, exerted at maturity; spikelets 1.5-1.9 mm. long, obovate, turgid, pilose; first glume half as long as spikelet; second glume and sterile lemma subequal; fertile lemma 1.6 mm. long, broad-elliptic.

Distribution: Michigan to Minnesota southward to Oklahoma and Texas. **Oklahoma:** Muskogee Co., Little; Norman, Prier; Pawhuska, Stevens; Stillwater, Learn; Stillwater, Hitchcock.

Remarks: This species is found on dry prairies and open places. It is of but little economic importance.

12. *Panicum tennesseense* Ashe. Tennessee Panic-grass.

Stems tufted 2.5-6 dm. tall, slender, suberect, finally much branched and prostrate; sheaths papillose-hirsute with long spreading hairs; ligule about 4 mm. long; blades within white margins, lower side appressed-pubescent to nearly glabrous, upper side glabrous or with few long scattered hairs; panicle 4-7 cm. long and nearly as wide; many flowered; spikelets 1.6-1.7 mm. long, obovate-obtuse, turgid, pubescent; first glume about one-fourth as long as spikelet; second glume shorter than sterile lemma; fertile lemma 1.4 mm. long.

Distribution: Maine to Minnesota and Utah, south to Arizona and Florida. **Oklahoma:** LeFlore Co., Stevens; Muskogee Co., Little; Ottawa Co., Stevens; Pawhuska, Stevens; Sapulpa, Bush.

Remarks: This species is found on moist ground and the borders of woods. It is of little economic importance. Summer.

13. *Panicum huachucae* Ashe. Hairy Panic-grass.

Stems 2-6 dm. tall, erect or ascending, simple or profusely branched, papillose-hirsute with ascending hairs; nodes bearded; ligule 3-4 mm. long; blades stiffly erect or ascending, densely short pilose above, lower side densely pubescent; panicle 4-6 cm. long and almost as wide, many flowered; spikelets 1.6-1.8 mm. long, ovate-obtuse, turgid, papillose-pubescent; first glume about one-third as long as spikelet; second glume and sterile lemma subequal, scarcely covering the fruit at maturity; fertile lemma about 1.5 mm. long, wide-elliptic.

Distribution: Maine to Montana, south to Texas and Mississippi, also in Arizona and California. **Oklahoma:** Fort Sill, English; Muskogee Co., Little; Norman, Prier; Chelsea, Bush; Wichita Mts., Stemen & Myers.

Remarks: Found in open ground. It is seldom abundant enough to be of any importance. Summer and fall

9. *Panicum villosissimum* Nash.

Spring stems 2.5-4.5 dm. tall, erect or ascending, pilose with spreading hairs, sheaths pilose; ligule 4-5 mm. long; blades 6-10 cm. long, 5-10 mm. wide, pilose; panicle 4-8 cm. long, branches spreading or ascending; spikelets 2.2-2.3 mm. long, pilose; autumn stems finally prostrate, leaves of fascicled branches appressed.

Distribution: Massachusetts to Minnesota, south to Florida and Texas. **Oklahoma:** LeFlore Co., Little & Olmsted; Cleveland Co., Eskew; LeFlore Co., Demaree; McCurtain Co., Little & Olmsted.

Remarks: Found on dry sandy or poor soil. It has but very little economic value.

14. *Panicum sphaerocarpon* Ell.

Plants 2-5 dm. tall, more or less in tufts, simple at first but later branched from the middle or above; stems with appressed-pubescent at nodes, internodes glabrous, sometimes with viscid spots between the nerves; sheaths ciliate on margins, sometimes viscid spots between the nerves, otherwise glabrous; ligule wanting; blades 10 cm. long or less, 14 mm. wide or less, scabrous above, smooth beneath, margins white scabrous and ciliate toward the base; panicle 10 cm. long or less, primary panicles long exserted, secondary short exserted or partly included; spikelets about 1.5 mm. long, puberulent; first glume about one-fourth the length of spikelet.

Distribution: Vermont to Kansas and Texas. **Oklahoma:** Muskogee Co., Little; Norman, Prier; Sapulpa, Bush; Stillwater, Hitchcock.

Remarks: This species is found on sandy soils. It is not abundant enough in Oklahoma to be of economic importance. Summer and fall.

15. *Panicum polyanthes* Schult. Small-fruited Panic-grass.

Stems erect, 3-9 dm. tall, stout, simple or finally branched, nodes glabrous or nearly so; sheaths usually overlapping, glabrous, ciliate on the margins; ligule inconspicuous; blades thin, prominently nerved, 12-23 cm. long, 15-25 mm. wide; rough or smooth on upper side, smooth below, base cordate; panicles 8-25 cm. long, one-half to one-fourth as wide, densely flowered; spikelets 1.5-1.6 mm. long, obovoid-spherical, minutely puberulent; first glume one-third to two-fifths as long as spikelet; second glume and sterile lemma equalling fruit at maturity.

Distribution: New Jersey to Oklahoma, south to Georgia and Texas. **Oklahoma:** LeFlore Co., Stevens; LeFlore Co., Blakley; Muskogee Co., Little; Poteau, Hitchcock; Stillwater, Learn.

Remarks: This species is found on damp soil. It is not abundant enough in Oklahoma to be of any importance. Summer and fall.

16. *Panicum scoparium* Lam. Velvety Panic-grass.

Stems 8-13 dm. long, stout, erect or ascending, more or less velvety pubescent throughout, nodes villous with reflexed hairs; sheaths shorter than internodes, velvety-pubescent absent on back near the top; ligule 1 mm. long; blades softly pubescent, 5-20 cm. long, 5-18 mm. wide; panicle 8-15 cm. long, almost as wide, branches and pedicels with viscid blotches; spikelets 2.4-2.6 mm. long, ovate, turgid, papillose-pubescent; first glume one-fifth to one-fourth as long as spikelet; second glume and sterile lemma strongly nerved and shorter than the fruit at maturity; fertile lemma 2 mm. long, ovate-elliptic, spiculate.

Distribution: Massachusetts to Oklahoma, south to Florida and Texas. **Oklahoma:** Choctaw Agency, Bigelow; LeFlore Co., Stevens; Norman, Prier; Osage Co., Stevens.

Remarks: This species is found on damp soils. It is not abundant enough in Oklahoma to be of any importance. Summer.

17. *Panicum clandestinum* L. Corn-grass. Deer-tongue-grass.

Stems erect or ascending, 1.5-15 dm. tall, stout; sheaths as long as the internodes or overlapping, papillose-hispid to nearly glabrous; blades spreading, 5-20 cm. long, 1.5-3 cm. wide, scabrous on both sides, ciliate at the base; panicle 8-15 cm. long and three-fourths as wide; spikelets 2.7-3 mm. long; first glume one-third as long as spikelet; second glume shorter than sterile lemma and fruit; fertile lemma about 2.2 mm. long.

Distribution: Maine to Michigan and Kansas, southward to Florida and Texas. **Oklahoma:** Hinton, Stevens; Muskogee Co., Little; Ripley, Elledge; Sapulpa, Bush; Stillwater, Featherly; Waynoka, Stevens.

Remarks: This species is found on moist sandy soil. It is not abundant enough in Oklahoma to be of much importance. Summer.

18. *Panicum boscii* Poir. Panic-grass.

Stems erect or ascending, 4-7 dm. tall, at first simple, later branched, minutely puberulent, nodes retrorsely bearded; sheaths glabrous or softly pubescent; blades spreading, 7-12 cm. long, 1.5-3 cm. wide, glabrous or softly pubescent; panicles 6-12 cm. long and as wide or wider; spikelets 4-4.5 mm. long and about 2 mm. wide, oblong-obovate, papillose-pubescent; first glume one-third to two-fifths as long as spikelet; second glume slightly shorter than the fruit and sterile lemma at maturity; fertile lemma 3.2-3.5 mm. long, minutely pubescent, usually black at the tip.

Distribution: Massachusetts to Illinois and Oklahoma south to Florida and Texas. **Oklahoma:** LeFlore Co., Stevens; without locality, Butler; McCurtain Co., Little & Olmsted; Muskogee Co., Little; Cherokee Co., Little.

Remarks: This species is found in woods. It is not abundant enough in Oklahoma to be of any importance. Summer.

19. *Panicum mutabile* Scribn. & Smith. Tall Fringed Panic-grass.

Stems solitary or few in a tuft, 3-7 dm. tall, glaucous, erect, usually glabrous; sheaths glabrous except the ciliate margins; ligule very short; blades spreading 6-15 cm. long, 8-20 mm. wide, tapering to both ends, glabrous on both sides, ciliate on the margins; panicles 7-15 cm. long and about as wide, loosely few-flowered; spikelets about 3 mm. long, elliptic, pubescent; first glume about one-third as long as spikelet; second glume and sterile lemma equaling or exceeding the fruit; fertile lemma 2.6 mm. long.

Distribution: South Carolina to Oklahoma, south to Florida and Texas. **Oklahoma:** Cleveland Co., Prier; Norman, Bruner.

Remarks: This species is found on sandy soil. It is rare in Oklahoma. Summer.

20. *Panicum commutatum* Schult

Spring stems 4-7 dm. tall; sheaths glabrous or nearly so; blades 5-12 cm. long, 12-25 mm. wide, usually glabrous, sometimes puberulent beneath; panicle 5-12 cm. long; spikelets 2.6-2.8 mm. long, elliptic. Autumn stems erect or leaning, branched from the middle nodes, secondary branches crowded toward the summit.

Distribution: Woods and cut-over land from Massachusetts to Michigan, south to Texas and Florida. **Oklahoma:** LeFlore Co., Little & Olmsted.

Remarks: It is not abundant enough to be of economic importance.

21. *Panicum microcarpon* Muhl. Barbed Panic-grass.

Stem at first simple, erect, later freely branching, prostrate or leaning. 6-10 dm tall, nodes densely bearded with reflexed hairs; sheaths glabrous or the lower pubescent, ciliate on the margins; blades spreading, 10-12 cm. long, 8-15 mm. wide, usually smooth and glabrous; panicles 8-12 cm. long, ovate; spikelet 1.6 mm. long, elliptic, usually glabrous; first glume about one-fourth the length of spikelet; second glume somewhat shorter than the fruit and sterile lemma; fertile lemma 1.3-1.4 mm. long, elliptic.

Distribution: Massachusetts to Illinois and Oklahoma, southward to Florida and Texas. **Oklahoma:** LeFlore Co., Stevens.

Remarks: This species is found in wet woods and swampy places. It is not common in Oklahoma. Summer.

22. *Panicum barbulatum* Michx.

Stems 5-8 dm. tall, much branched, slender branches often recurved, lower nodes usually with a beard of divergent hairs; spikelets 2 mm. long; second glume as long as fruit at maturity.

Distribution: Eastern Texas, Oklahoma, Illinois and eastward. **Oklahoma:** McCurtain Co., Little & Olmsted.

Remarks: Dry sterile woods. The distribution is the same as for *P. dichotomum*. This species intergrades with *P. dichotomum* and it is doubtful if it should be given the rank of species.

23. *Panicum dichotomum* L. Forked Panic-grass.

Stems erect, 3-5 dm. tall, much branched; sheaths glabrous or ciliate on the margins; blades spreading, 5-11 cm. long, 4-8 mm. wide, glabrous on both sides, lower blades ciliate on margins; lower nodes sometimes with a few spreading hairs; panicles 4-9 cm. long, spreading; spikelets 2 mm. long, wide-elliptic; first glume one-third as long as spikelet; second glume and sterile lemma faintly nerved, glume shorter than fruit at maturity; fertile lemma 1.8 mm. long.

Distribution: New Brunswick to Michigan and Oklahoma southward to Florida and Texas. **Oklahoma:** LeFlore Co., Stevens.

Remarks: This species is found in dry woods. It is not common in Oklahoma. Summer.

24. *Panicum texanum* Buckl. Texas Panicum, Colorado-grass.

Stems 5-16 dm. tall or more, erect or decumbent at the base, simple or branched, pubescent; sheaths velvety pubescent; blades 5-15 mm. wide, 25 cm. long or less, flat, velvety pubescent on both surfaces; panicle 1-2.5 dm. long, narrow, branches of long erect, secund, spike-like racemes, axis and branches pubescent; spikelets 5-6 mm long, first glume more than half as long as the spikelet.

Distribution: Oklahoma to Texas and Mexico. **Oklahoma:** Hinton, Tilley; El Reno, Childers; Cheyenne, Taylor; Rush Springs, Horn.

Remarks: This species is not abundant enough in Oklahoma to be of any economic importance. Summer and fall.

25. *Panicum dichotomiflorum* Michx. Spreading Witch-grass. Sprouting Crab-grass.

Stems 5-20 dm. tall, ascending from a geniculate base, usually smooth but variable; sheaths loose, often compressed, usually longer than the internodes, blades flat or somewhat folded, midnerve usually prominent; panicle 1-4 dm. long, pyramidal, spreading; spikelets 2-3 mm. long, lanceolate; first glume about one-fourth as long as spikelet; second glume and sterile lemma more or less pointed beyond the fruit; fertile lemma smooth, shining, indurated, 1.8-2 mm. long.

Distribution: Found throughout the southeastern half of the United States. **Oklahoma:** False Washita, Palmer; Fort Sill, English; Major Co., Stevens; Muskogee Co., Little; Muskogee, Pammel; Norman, Prier; Oklahoma Co., Stemen & Myers; Ponca, Stevens; Stillwater, Featherly; Waurika, Richardson; Claremore, Brunkow; Osage Co., Penn.

Remarks: This species is found on moist soil and is quite often a weed in waste places and cultivated fields. Summer and fall.

26. *Panicum miliaceum* L. Broom-corn Millet. Horse-grass. Brown Millet.

Stems stout, erect or decumbent at the base, 2-10 dm. tall, branching from the lower nodes, glabrous or hirsute; sheaths papillose-hispid; blades more or less pubescent; panicle 1-2.5 dm. long, usually included at the base more or less nodding; spikelets 4.5-5 mm. long; first glume one-half to two-thirds as long as the spikelet; second glume and sterile lemma subequal; fertile lemma 3 mm. long, 2 mm. wide.

Distribution: Found throughout the eastern half of the United States and also in California. **Oklahoma:** Longdale, Bateman.

Remarks: This species is cultivated under the name of broom-corn millet. It has escaped from cultivation in some places. Summer and fall.

27. *Panicum philadelphicum* Berrh.

Plants 5 dm. tall or less, more or less tufted, branching from near the base; stems slender, more or less papillose-hispid, lower internodes short; sheaths horizontally papillose-hispid, usually longer than the internodes; blades more or less hirsute; panicle 2 dm. long or less, exserted, diffuse with capillary branches; spikelets glabrous, short pediceled, borne 2 on a branch, ovate lanceolate, acuminate, about 2 mm. long, first glume about two-fifths as long as the spikelet.

Distribution: Quebec to Wisconsin southward to Texas. **Oklahoma:** Muskogee Co., Little; Sapulpa, Bush; Washita Co., Stevens; Osage Co., Penn.

Remarks: This species is found on dry sandy soils. It is of no economic importance. Summer and fall.

28. *Panicum flexile* (Gattinger) Scribn.

Plants 2-6 dm. tall, erect, branched near the base; stems pubescent at nodes, papillose-hirsute below nodes; sheaths papillose-hirsute with ascending hairs; blades 25 cm. long or less, erect; panicles 1-20 dm. long, erect, few flowered, branches erect or ascending; spikelets glabrous, about 3.5 mm. long, lanceolate, acuminate, first glume about one-third the length of spikelet.

Distribution: Ontario to Pennsylvania, southwest to South Dakota and Texas. **Oklahoma:** Muskogee Co., Little.

Remarks: Found in sandy, usually damp soils. It is not abundant enough in Oklahoma to be of economic importance. Summer.

29. *Panicum capillare* L. Witch-grass. Tumble-weed. Tickle-grass. Old-witch-grass. Fool-hay.

Stems erect or ascending, 2-8 dm. tall, usually simple, papillose-hispid to nearly glabrous, nodes densely pubescent; sheaths usually longer than the internodes, papillose-hispid; blades wide, hispid on both sides; panicle diffuse often half as long as the plant; spikelet 5-7 nerved; second glume and sterile lemma equal, fertile lemma 1.5 mm. long.

Distribution: United States east of the Rocky Mountains, also in California. **Oklahoma:** Alfalfa Co., Stevens; Fort Sill, English; Huntsville, Blankinship; Muskogee Co., Little; Norman, Prier; Oklahoma Co., Stemen & Myers; Ottawa Co., Stevens; Perkins, Featherly; Stillwater, Stratton; Stillwater, Featherly; Claremore, Brunkow; Kingfisher, Byers; Osage Co., Penn.

Remarks: Found in fields and waste places. It is of no economic importance. Summer and fall.

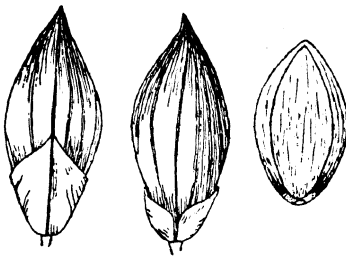


Fig. 125. *Panicum hillmani*
(after Chase)

30. *Panicum hillmani* Chase. Barbed Witch-grass.

Stems in small tufts, 1.5-3.5 dm. tall, erect or geniculate at the base, papillose-pilose below panicle and nodes, sterile stems common; sheaths usually longer than internodes, papillose-hispid; blades hispid on both sides, 7-13 cm. long, 3-10 mm. wide; panicle 10-17 cm. long and about as broad; spikelets 2.5-3 mm. long, turgid, acuminate; first glume two-fifths as long as spikelet; second glume and sterile lemma equal, exceeding the fruit; fertile lemma 2 mm. long; fruit with a prominent scar at the base.

Distribution: Kansas to Texas. **Oklahoma:** Washita or Swanson Co., Stevens; Kingfisher, Sister Constance Grace.

Remarks: This species is found on dry soils and in cultivated fields. It is of little economic importance. Summer and fall.

31. *Panicum obtusum* H. B. K. Blunt Panic-grass. Vine Mesquite. Grapevine-grass.

Stems usually tufted, erect, 2-8 dm. tall, from a more or less knotty rootstock, glabrous, smooth, simple or branching at the base; sheaths smooth; blades erect, firm, usually involute toward the tip, glabrous on both sides; panicle 3-12 cm. long with few densely flowered raceme-like branches; spikelets about 3 mm. long, short pediceled, arranged on one side of the rachis, turgid; first glume as long as the spikelet, 5-nerved; second glume and sterile lemma subequal; fertile lemma 3-3.5 mm. long, smooth and shining.

Distribution: Missouri to Colorado and Arizona, south to Mexico. **Oklahoma:** False Washita, Palmer; Fort Sill, English; Hollis, Stevens; Hopeton, Stevens; Hunter, Trekel; Major Co., Stevens; Norman, Prier; Stillwater, Stratton; Washita Co., Stevens; Love Co., Forbs; Osage Co., Penn.

Remarks: This species is found on sandy or gravelly soil, usually along stream banks or sand bars. It is of no economic importance. Summer and fall.

32. *Panicum geminatum* Forsk.

Stems slender, tufted, 2.5-8 dm. tall, often decumbent at the base or with stolons rooting at the nodes; blades 10-20 cm. long; 3-6 mm. wide, flat or involute toward the tip; panicle 12-30 cm. long with 12-18 appressed racemes 3 cm. or less long; spikelets 2.2-2.4 mm. long.

Distribution: Found on moist ground or in shallow water from Florida to Texas. **Oklahoma:** Davis, Featherly & Cornelius.

Remarks: This plant is very rare in Oklahoma. The only record is the above specimen taken near a spring in the Arbuckle Mts., near Davis. This is perhaps the northernmost record for the species.

33. *Panicum hians* Ell.

Stems 2-6 dm. tall, usually erect, sometimes decumbent or prostrate with erect branches; blades 5-15 cm. long, 5 mm. or less wide, flat or folded, pilose near the base above; panicle 5-20 cm. long, loose and open; primary branches few, slender, distant, spreading or drooping, secondary branches borne above the middle or toward the ends; spikelets 2.2-2.4 mm. long, borne in more or less secund clusters.

Distribution: North Carolina to Florida and Texas south to Mexico and north to Oklahoma and Missouri. **Oklahoma:** McCurtain Co., Little & Olmsted; Muskogee Co., Little.

34. *Panicum agrostoides* Spreng. Red-top Panic.

Stems erect, tufted, 5-10 dm. tall, stout, compressed, much branched, mostly glabrous; sheaths compressed, longer than the internodes, sometimes pilose at the summit; blades erect, flat, conduplicate at the base, 2-5 dm. long, 5-12 mm. wide; panicles pyramidal, 1-3 dm. long, primary branches spreading, secondary branches appressed, or divergent; pedicels bearing at their summit one or more white hairs, one-fourth to one-third as long as spikelet; spikelet 1.5-2 mm. long; first glume hardly one-half as long as spikelet; second glume and sterile lemma subequal, 5-nerved; fertile lemma 1.3 mm. long.

Distribution: Maine to Illinois and Kansas south to Florida and Texas, also California. **Oklahoma:** Craig Co., Stevens; Muskogee Co., Little; Muskogee Co., Pammel; Ottawa Co., Stevens; Poteau, Hitchcock; without locality, Sheldon.

Remarks: This species is found along stream banks, in wet meadows and swampy places. It is of but little economic importance in Oklahoma. Summer and fall.

35. *Panicum virgatum* L. Switch-grass. Wild Red-top.

Stems erect, 1-2 m. tall from creeping rootstocks, simple, stout, more or less glabrous, often glaucous; sheaths longer than the internodes; ligules 1-4 mm. long; blades 1-6 dm. long, 3-15 mm. wide; flat, smooth or pilose near the base above; panicle 1.5-5 dm. long, pyramidal, open; spikelets usually 3.5-5 mm. long, ovate, acuminate, strongly nerved; first glume clasping, two-thirds to three-fourths as long as spikelet, acuminate to cuspidate, 5-nerved; second glume longer than sterile lemma, both longer than the fruit.

Distribution: Maine to Montana southward to Nevada, Texas and Florida. **Oklahoma:** False Washita, Palmer; Fort Sill, English; Hooper, Ebersole; Idabel, Latimer; Muskogee Co., Little; Norman, Prier; Norman, Stemen & Myers; Purcell, Stevens; Rosston, Stevens; Stillwater, Featherly; Stillwater, Learn; Stillwater, Stratton; Tulsa, De Yarmett; Verdigris River, Blankenship; Watonga, Rapp; Watonga, Graff; Vinita, Hildebrand; Kingfisher, Byers; Claremore, Brunkow.

Remarks: This species is found on a variety of soils. It is grazed closely by livestock in the spring and in many localities it forms an important constituent of wild prairie hay. Summer and fall.

36. *Panicum anceps* Michx. (*P. rostratum* Muhl.) Beaked Panic-grass. Flat-stemmed Panic-grass.

Stems 5-15 dm. tall from scaly creeping rootstocks, much branched, compressed, smooth; sheaths compressed, smooth or the lower ones pubescent; blades erect, flat, 2-5 dm. long, 4-12 mm. wide, pilose on upper side, usually smooth below; panicle long exserted, 1.5-4 dm. long, pyramidal,

branches crowded with somewhat curved, more or less secund spikelets; spikelets 3.4-3.8 mm. long; first glume one-third to one-half as long as spikelet; second glume and sterile lemma subequal, forming a beak beyond the fruit; fertile lemma 2-2.2 mm. long.

Distribution: New Jersey to Kansas south to Florida and Texas. **Oklahoma:** Choctaw Agency, Bigelow; False Washita, Palmer; Kingfisher Co., Carleton; Muskogee Co., Little; Norman, Prier; Norman, Bruner; Norman, Stemen & Myers; Bartlesville, Brannon; Murray Co., Merrill & Hogan; Muskogee Co., Little.

Remarks: This species is found on moist sandy soil. It is of little economic importance. Summer and fall.

ZEA L.

Tall, stout, annual, monocious grasses with solid stems and a terminal cluster of staminate spikes. Pistillate flowers borne on 1-3 solitary axillary spikes with very thick rachises; staminate spikelets 2-flowered, in pairs, one nearly sessile, the other pedicellate; stamens 3, pistillate spikelets sessile in pairs, consisting of one fertile and one sterile flower; the entire pistillate inflorescence except the stigmas enclosed in large foliaceous bracts.

1. *Zea mays* L. Maize. Indian Corn. Field Corn.

Stems 1-4 m. tall, straight, simple, sometimes suckering at the base, roots extending from the lower nodes to the ground; staminate flowers borne on a cluster of spikes or spike-like panicles at the top of the stem; pistillate spikelets borne in pairs in 8-24 rows on a thick cylindrical rachis (cob), spikelets 2-flowered, one sterile, the other fertile with a very long slender pistil with the stigmatic surface extending almost half its length, glumes, lemmas and paleas very small and chaff-like.

Remarks: This species is found more or less throughout the temperate zones as a forage and grain plant. Spring, summer and fall.

1a. *Zea mays* var. *tunicata* St. Hil. Pod Corn.

Each kernel or fruit enclosed by a separate bract or scale and the entire spike enclosed with large foliaceous bracts.

1b. *Zea mays* var. *everta* Bailey. Pop Corn.

High percentage of corneous endosperm in kernel (fruit) and very small germ (cotyledon). The kernels (fruits) and ears (spikes) very small.

Remarks: When heated under the proper conditions, the kernels will explode and turn completely inside out.

1c. *Zea mays* var. *indurata* Bailey. Flint Corn. Yankee Corn.

The kernel (fruit) of starchy endosperm surrounded by corneous endosperm; kernels smooth, undented; few rows of kernels to the ear.

Remarks: This variety matures in a short time and is grown mostly along the northern border of the corn belt.

1d. *Zea mays* var. *indentata* Bailey. Dent Corn.

Horny endosperm around the sides of kernel with starchy endosperm at the top.

Remarks: At maturity in drying and shrinking the end of the kernel is drawn in and various forms of indentation occur. This is the principal variety grown in the corn belt.

1e. *Zea mays* var. *rugosa* Bonaf. (*Z. mays* var. *saccharata* Bailey.) Sweet Corn. Sugar Corn.

Kernels (fruit) much wrinkled, horny endosperm more or less translucent, sweet.

TRIPSACUM L.

Tall, robust, monoecious perennials with stout rootstocks, broad leaves, terminal and axillary inflorescence of 1-3 spikes; spikelets unisexual, staminate and pistillate spikelets on the same axis, the staminate immediately above the pistillate spikelets; staminate spikelets 2-flowered, in pairs along one side of a continuous rachis, one sessile, the other sessile or pedicellate; pistillate spikelets single and alternate on a thick, hard, subcylindrical, articulate rachis, sunken into hollows at the rachis joints, 1-flowered with a sterile lemma.



Fig. 126. *Tripsacum dactyloides*

***Tripsacum dactyloides* L. Gama-grass.
Sesame-grass. Bull-grass.**

Stems 1-2.5 m. tall, erect, stout; sheaths subcylindrical, keeled, blades scabrous above, 3-6 dm long, truncate or subcordate at the base; spikes terminal and axillary, from 1-3 together, 1-2.5 dm. long, lower spikelets pistillate, upper staminate; outer glumes of staminate spikelet linear, obtuse, 7-10 mm. long; pistillate spikelet orbicular-ovate 7-10 mm. long, first glume coriaceous.

Distribution: Rhode Island to Nebraska southward to Florida, Texas and Mexico. **Oklahoma:** Ellis Co., Stevens; Fay, Dalton; Fort Sill, English; Muskogee Co., Little; Norman, Prier; Norman, Bruner; Oklahoma Co., Stemen & Myers; Pauls Valley, Graff; Stillwater, Learn; Woods Co., Stevens; Osage Co., Penn.

Remarks: This plant is found in wet places, especially around lakes, swamps and streams. It is grazed some in the absence of more palatable species. Summer and fall.

ERIANTHUS Michx.

Perennial reed-like grasses with terminal, densely silky, panicles; spikelets all alike, in pairs, one sessile, the other pedicellate; rachis articulating below glumes; glumes equal, usually covered with long silky spreading hairs at the base; lemma produced into a long slender awn.

Basal hairs about as long as the brownish spikelets.....1. *E. contortus*
 Basal hairs copious, about twice as long as the
 yellowish spikelets.....2. *E. alopecuroides*

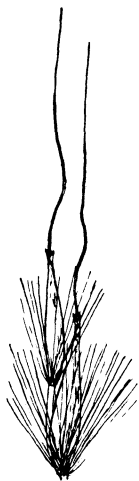


Fig. 127. *Erianthus contortus*

1. *Erianthus contortus* Ell. Spiral-awned Beard-grass.

Stems 1-2.5 m. tall; sheaths smooth or rough, often hirsute at the top; panicle 1.5-4 dm. long; spikelets as long as, or longer than, the basal hairs; glumes 7-9 mm. long; fertile lemma 2-toothed at the apex, awn 1.5-2.5 cm. long.

Distribution: Delaware to Oklahoma, southward to Florida and Texas. **Oklahoma:** LeFlore Co., Stevens; McCurtain Co., Little & Olmsted.

Remarks: This plant is found on low meadows. It is sometimes cultivated as an ornamental plant. Fall.

2. *Erianthus alopecuroides* (L.) Ell. *E. divaricatus* (L.) Hitchc.) Silver Plume-grass.

Stems robust, 1.5-3 m. tall, appressed-villous below the panicle; sheath glabrous, pilose at summit; blades 1.5-2 cm. wide, pilose on upper surface near base; panicle 2-3 dm. long, silvery to tawny or purplish, densely plumose; spikelets 5-6 mm. long with a flat, loosely twisted awn 1-1.5 cm. long, spikelet about half as long as the basal hairs.

Distribution: Found in damp woods and open ground from southern New Jersey, southern Indiana, southern Missouri to eastern Oklahoma southward. **Oklahoma:** Specimen (727529) in the U. S. National Herbarium labeled *Erianthus*-var. *contortus*, *alopecuroides*, Indian Territory. The collector's name is not on the label nor is the date. The place on the form label for date is made 188_, which shows that it was probably collected sometime in the eighties.

Remarks: This makes a beautiful ornamental grass.

MANISURIS L.

Perennial slender grasses of medium height with smooth cylindrical or subcylindric spikes; spikelets in pairs, one sessile and fertile, the other pedicellate and sterile, often rudimentary; rachis articulate at the joints, the upper end of the rachis joints thickened, these with the spikelets forming a cylinder.

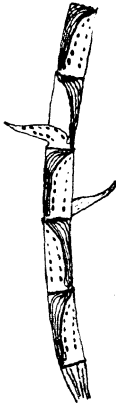


Fig. 12x. *Manisuris cylindrica*

***Manisuris cylindrica* Kuntze.** Pitted Joint-grass. Rat-tail-grass.

Stems 3-9 dm. tall, slender, from creeping rootstocks; sheaths glabrous; blades 1.5-4 dm. long; spikes 6-10 cm. long, usually somewhat curved, cylindrical, spikelet 4.5-5 mm. long, about equaling the internode of the rachis; first glume pitted in longitudinal rows; pedicellate spikelet rudimentary and curved around the margin of the fertile spikelet.

Distribution: Georgia, Missouri and Oklahoma, southward. **Oklahoma:** Ingalls, Stratton; Muskogee Co., Little; Norman, Prier; Oklahoma Co., Stemen & Myers; Stillwater, Featherly; Osage Co., Penn.

Remarks: This plant is found on sandy soil in both woods and open ground. It forms some grazing where abundant enough. Summer.

ANDROPOGON L.

Coarse, usually tall, more or less tufted, branched, perennials with solid stems and spike-like racemes which are single, in pairs, or many, usually exserted; spikelets in pairs at each node of an articulate rachis, one sessile and perfect, the other pedicellate, either staminate or neuter; the pedicel often hairy and sometimes conspicuously so.

- | | |
|--|------------------------|
| 1. Peduncle bearing a solitary raceme | 2 |
| Peduncle bearing 2 to many racemes | 3 |
| 2. Internodes of rachis relatively thick; racemes straight | 1. <i>A. tener</i> |
| Internodes of rachis slender; racemes flexuose | 2. <i>A. scoparius</i> |
| 3. Racemes 2 to several on each peduncle, digitate | 4 |
| Racemes several to numerous, not digitate | 7 |
| 4. Pedicellate spikelet staminate, similar to sessile spikelet | 5 |
| Pedicellate spikelet reduced to one or two glumes or wanting;
racemes silky-villous | 6 |
| 5. Rhizomes short or wanting; awn of sessile spikelet 1-2 cm.
long | 3. <i>A. furcatus</i> |
| Rhizomes well developed; awn of sessile spikelet rarely over
5 mm. long | 4. <i>A. hallii</i> |

- 6. Peduncles not more than 1 cm. long; racemes sparsely hairy 5. *A. virginicus*
- Peduncles 2 cm. long or more; racemes copiously long-villous 6. *A. ternarius*
- 7. Panicle more or less fan-shaped; nodes bearded with short spreading hairs 7. *A. barbinodis*
- Panicle oblong; nodes appressed hispid to glabrous 8. *A. saccharoides*

1. *Andropogon tener* (Nees) Knuth.

Stems slender, tufted, 6 to 10 dm. long, sparingly branching; blades about 1 mm. wide, flat or involute; raceme terminal, erect, terete, glabrous, long exserted, 2 to 6 cm. long; sessile spikelet about 4 mm. long, awn 7 to 10 mm. long.

Distribution: Coastal Plain, Georgia to Florida and Texas and in Oklahoma. **Oklahoma.** Apache, Ellithorp.

Remarks: Dry pine woods and prairie. Rare.

2. *Andropogon scoparius* Michx. Little Blue-stem.

Stems 4-15 dm. tall, tufted, usually much branched, green or reddish-purple in color; sheaths smooth to pubescent; blades commonly rough, more or less hirsute above near the base; racemes 3-6 cm. long, exserted; sessile spikelet 5-7 mm. long; awn spiral, more or less bent, 8-16 mm. long; pedicellate spikelet reduced to one scale.

Distribution: Maine to Saskatchewan and Montana, southward to Florida, Texas and New Mexico. **Oklahoma:** Fort Sill, English; Norman, Prier; Oklahoma City, Stemen & Myers; Payne Co., Featherly; Stillwater, Stratton; Woods Co., Stevens; Mayes Co., Lehman; Osage Co., Penn; Pushmataha Co., Barclay.



Fig. 129. *Andropogon scoparius*

Remarks: This species is an important grass of the prairies. It furnishes good grazing for all livestock and is one of the principal constituents of wild prairie hay. Summer and fall.



Fig. 130. *Andropogon furcatus*
(U. S. D. A. Div. Agros.)

3. *Andropogon furcatus*
Muhl. (*A. provincialis* Lam.)
Forked Beard-grass. Big
Blue-stem. Blue-joint.

Stems 1-2 m. tall, tufted, erect, smooth, often glaucous, branched above; sheaths terete, smooth or the lower ones pubescent; blades smooth or rough, lower ones long acuminate; racemes in pairs or approximate at the summit, 5-10 cm. long, stout, exserted or partly included; rachis and pedicels with hairs 1-2 mm. long; sessile spikelet 7-10 mm. long, scabrous, twice as long as rachis joints, awn 7-14 mm. long; pedicellate spikelet of 4 scales.

Distribution: Maine to Saskatchewan, southward.
Oklahoma: Fort Sill, English; Guthrie, Dobson; McClain Co., Stevens; Muskogee Co., Little; Norman, Prier; Oklahoma Co., Stemen & Myers; Ottawa Co., Stevens; Payne Co., Featherly; Stillwater, Stratton; Woods Co., Stevens; Cimarron Co., Goodman; Mayes Co., Lehman; Kingfisher, Byers; Claremore, Brunkow; Osage Co., Penn; Pushmataha Co., Barclay.

Remarks: This species is found on open prairies. It is grazed by all kinds of livestock and forms an important constituent of wild prairie hay. Summer and fall.



Fig. 131. *Andropogon hallii*
(U. S. D. A. Div. Agros.)

4. *Andropogon hallii*
Hack. Hall's Beard-grass.
Turkey-foot-grass.

Stems 1-2 m. tall, smooth, glaucous, from creeping rootstocks, simple below, branched above; racemes 2-3, 3-5 cm. long, exserted or included, joints of the rachis and pedicels pubescent with silky gray or yellow hairs, almost as long as rachis joints; sessile spikelet 8-9 mm. long; awn imperfect; pedicellate spikelet awnless, about as long as sessile spikelet.

Distribution: North Dakota to Wyoming southward to Texas and Arizona. **Oklahoma:** Harper Co., Stevens; Norman, Stemen & Myers; Fort Sill, English; Canadian Co., Little; Greer Co., Bull.

Remarks: This species is found on dry soils. It is not very abundant in Oklahoma. Summer.

5. *Andropogon virginicus* L. Broomsedge.

Stems erect, tufted, 5-10 dm. tall, branched; sheaths glabrous to more or less pilose along margins, the lower compressed; ligule ciliate; blades pilose on upper surface near the base; inflorescence elongate, narrow; racemes partly included in the short dilated sheaths; rachis slender, flexuous, long-villous; spikelets about 3 mm. long; awn delicate, straight, 1-2 cm. long; sterile pedicel long-villous, its spikelet wanting or nearly so.

Distribution: New York to Kansas, south to Florida and Texas. **Oklahoma:** Payne Co., Featherly; Mayes Co., Lehman; Osage Co., Penn. Quite common in the eastern half of the state.

Remarks: This species is relatively abundant in some sections on poor, rocky or sandy soils. It is less palatable than the other species of *Andropogon* in the state.

5a. *Andropogon virginicus* var. *corymbosus* (Chapm.) Fern. & Griscom.
Bushy Beard-grass. Bushy Blue-stem.

Stems 4-9 dm. tall, smooth simple below, branched above, branches repeatedly branched; sheaths compressed; blades long acuminate; branches elongated, forming a compact terminal inflorescence; racemes in pairs, 2-3 cm. long, usually partly included in the upper sheath; rachis joints and pedicels pubescent with long silky hairs; sessile spikelet 4-5 mm. long, awn 12-18 mm. long, pedicellate spikelet a single scale or wanting.

Distribution: Massachusetts to Florida, west to Kentucky, Oklahoma, Nevada and California. **Oklahoma:** Cleveland Co., Hefley & Prier; Oklahoma Co., Stemen & Myers; Turner Falls, Featherly.

Remarks: This variety is found on damp soils. It is not very common in Oklahoma.

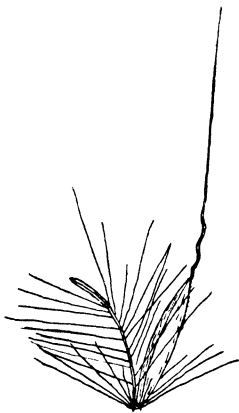


Fig. 132. *Andropogon ternarius*

6. *Andropogon ternarius* Michx. Silvery Beard-grass.

Stems tufted, 8-12 dm. tall, erect, simple below, branched above; sheaths somewhat compressed, usually smooth; blades often ciliate on margin toward base, racemes in pairs, 3-5 cm. long, exserted, silvery-gray; hairs at the end of rachis internode 1.5-2 times its length; sessile spikelet 5-6 mm. long, twice as long as the internode, first glume pubescent between the nerves, awn contorted 1.5-2.5 cm. long; pedicellate spikelet 1-scaled, 1-3 mm. long.

Distribution: Delaware to Oklahoma, southward to Florida and Texas. **Oklahoma:** Agusta, Stevens; Alva, Stevens; Muskogee Co., Little; Norman, Prier; Oklahoma Co., Stemen & Myers; Stillwater, Featherly; Osage Co., Penn.

Remarks: This species is found on dry, sandy soils. It is a filler grass, seldom appearing in perfect stands. Fall.

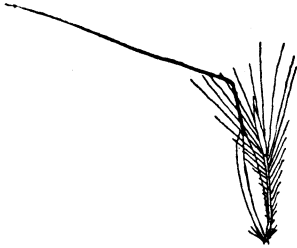
7. *Andropogon barbinodis* Lag. Barbed Beard-grass.

Stems 4-12 dm. tall, tufted, ascending, often branching below; nodes bearded with short spreading ascending hairs; sheaths sparsely hairy in the throat; blades more or less glabrous; panicle 7-10 cm. long, white-silky, plumose; spikelets 5-6 mm. long with twisted, geniculate awn 20-25 mm. long.

Distribution: Oklahoma to California south to Mexico. **Oklahoma:** Davis, Emig; Comanche Co., Demaree.

Remarks: Found on rocky slopes and eroded ground where it is an indicator of an early stage in plant succession. This grass resembles *A. saccharoides* except for the bearded nodes and larger spikelets.

8. *Andropogon saccharoides* Swartz.
(*A. torreanus* Steud.) Silvery Beard-grass.



Stems erect or geniculate at base, 4-12 dm. tall, simple or branched, nodes with ascending hairs, sheaths usually smooth, often glaucous; blades smooth, scabrous toward the base; terminal panicle of racemes long exserted, panicle 5-10 cm. long, racemes 2.5-4.5 cm. long; joints of rachis with translucent median line; sessile spikelet about equaling the terminal hairs of the rachis nodes; awn

Fig. 133. *Andropogon saccharoides* 8-16 mm. long, spiral, bent.

Distribution: Kansas to Colorado, south to northern South America.
Oklahoma: Alfalfa Co., Stevens; Chattanooga, Besemer; Fort Sill, English; Guthrie, Dobson; Kay Co., Stevens; Logan Co., Stevens; Muskogee Co., Little; Norman, Prier; Norman, Bruner; Payne Co., Featherly; Stillwater, Stratton; Tonkawa, Stevens; Tulsa, De Yarmett; Watonga, Graff; Woods Co., Stevens; Love Co., Forbs; Rocky, McCannon; Nardin, Smith; Osage Co., Penn.

Remarks: This species is found on dry soils and along roadsides. Summer and fall.

SORGHUM Pers.

(*Holcus* L.)

Stout, tall or moderately tall, annual or perennial grasses with flat blades and terminal panicles; spikelets in pairs, one sessile and fertile, the other pedicellate usually staminate, the terminal sessile spikelet with 2 pedicellate spikelets.

Plants perennial with stout creeping rootstocks.....1. *S. halepensis*
Plants annual with no rootstocks.....2. *S. vulgare*

1. *Sorghum halepensis* (L.) Pers. Johnson-grass.

Stems 5-15 dm. tall, smooth, glabrous, from running rootstocks; sheaths smooth; blades long acuminate; panicle 1.5-5 dm. long, branches usually whorled; sessile spikelet about 5 mm. long, ovate-lanceolate, purplish, appressed pubescent; awn deciduous, 8-16 mm. long, more or less bent; pedicellate spikelet 5-7 mm. long, sterile or staminate.

Distribution: Pennsylvania to Kansas, southward to Florida and Texas. **Oklahoma:** Cleo, Stevens; Fort Sill, English; Muskogee Co., Little; Norman, Prier; Norman, Stemen & Myers; Osage Co., Stevens; Stillwater, Featherly; Stillwater, Chambers; Stillwater, Stratton; Osage Co., Penn.

Remarks: This species is a good forage plant but as it is hard to eradicate it is considered a noxious weed. Summer and fall.

2. *Sorghum vulgare* Pers. Sorghum.

Stems 1-4 m. tall, erect, stout, often with brace roots from the lower nodes, and with a very variable terminal panicle; spikelets large, pubescent, variable in color from almost white, through reds and purples to black; lemmas awned or awnless.

Cultivated under the names: Sorgo, kafir, milo, broom corn, shallu, feterita, sudan-grass, and durra. Summer and fall.

2a. *Sorghum vulgare* var. *saccharatus* (L.) Boerl. Sorgo. Sorghum. Cane.

Distinguished by its sweet, juicy pith.

2b. *Sorghum vulgare* var. *technicum* (Koern.) Jav. Broom Corn.

Panicles long loose, branches 3-8 dm. long, erect or nodding, arising from a more or less short axis.

2c. *Sorghum vulgare* var. *roxburghii* (Stapf.) Haines. (S. roxburghii Stapf.) Shallu.

Plants erect, with dry pith; panicles loose with drooping branches; spikelets white or somewhat buff colored.

2d. *Sorghum vulgare* var. *durra* (Forak.) Hubb. & Rehder. Durra. Milo Maize. Milo. Jerusalem Corn.

Plants with dry pith, erect, inclined or reflexed; peduncles compact, panicle 1-2.5 dm. long; spikelets broadly ovate; glumes gray or greenish; fruits strongly flattened.

2e. *Sorghum vulgare* var. *caffrorum* (Thunb.) Hubb. & Rehder. Kafir. Kafir-corn.

Plants with somewhat juicy piths, short internodes and overlapping sheaths; peduncles erect; panicles cylindrical; spikelets ovate, 3-4 mm. wide.

2f. *Sorghum vulgare* var. *caudatum*. (Hack.) A. F. Hill. Feterita.

Plants with dry pith, very narrow and dense panicles, branches erect; fruit broad elliptical or orbicular, white, yellow or red.

2g. Sorghum vulgare var. sudanensis (Piper.) Hitchc. Sudan-grass.

Plants with slender stems, 2-3 m. tall; panicle pyramidal, branches whorled; spikelets usually awned, deciduous at maturity.

SORGHASTRUM Nash.

Moderately tall, erect, perennial grasses with narrow blades and compound panicles; spikelets in pairs, one sessile and fertile, the other wanting, only the pedicel present; glumes indurated, the first hirsute, inflexed over the second, lemma hyaline usually with a bent twisted awn.



Fig. 134. *Sorghastrum nutans*

Sorghastrum nutans (L.) Nash. (*Andropogon nutans* L.) Indian-grass. Bushy Blue-stem.

Stems 1-2.5 m. tall, smooth, nodes pubescent; sheaths glabrous or lower ones pubescent; blades long acuminate, scabrous; panicle 1-3 dm. long, slender, erect-spreading; spikelets 6-8 mm. long, lanceolate; glumes golden brown at maturity, first one densely pubescent, palea with a twisted, more or less bent, awn 1-1.5 cm. long.

Distribution: Ontario to Manitoba, southward to Florida, Texas and Arizona. **Oklahoma:** Fort Sill, English; Muskogee Co., Little; Norman, Prier; Norman, Jeffs; Oklahoma Co., Stemen & Myers; Stillwater, Featherly; Stillwater, Stratton; Tulsa, Stevens; Osage Co., Penn; Pushmataha Co., Barclay.

Remarks: This plant is found on prairies and in open woods. It is grazed by all classes of livestock, and often forms a constituent of wild prairie hay. Late summer and fall.

ADDENDA

Hilaria nutica (Buckl.) Benth. Reported by Mr. Burton Kiltz from southwestern part of the State, but specimen not seen by the author.

Sporobolus poiretii (Roem. & Schult.) Hitchc. Smut-grass. Collected about two miles north of McAlester, by Featherly.

Triodia oklahomensis Feath. Rhodora 40, June 1938.

Stems erect, tufted, 12 to 15 dm. tall, with either included or exserted panicle-bearing branches from the middle nodes, and a narrow terminal panicle 20 to 35 cm. long; sheaths loose, keeled; blades smooth, variable in width up to 12 mm. and in length up to 6 dm., falling freely from upper sheaths after maturity; panicle short-exserted or included at the base, narrow, purplish, more or less viscid, branches long, appressed-ascending; spikelets short-pedicelated, 6 to 8 mm. long, 4 mm. wide, 7 to 9 flowered; glumes about 4 mm. long, nearly equal.

Distribution: Oklahoma: Stillwater, Wade; Stillwater, Featherly; Collinsville, Penn; Claremore, Penn; Tulsa, Penn.

GLOSSARY

- Acuminate, gradually tapering to the end.
Acute, ending in a sharp or well-defined angle.
Aggregate, gathered in a cluster.
Apex, the tip of summit.
Aquatic, living in or under the water.
Articulate, jointed, separating freely by a clean scar.
Attenuate, slenderly tapering, becoming very narrow.
Axil, the angle formed by a leaf or branch with the stem.
Axillary, situated in, or pertaining to the axil.
Axis, stem, the part of a stem or branch upon which flowers are borne.
- Barbed, with short rigid reflexed points
Barbellate, having minute barbs.
Bifid, two-toothed, or two-cleft.
- Callus, an extension of the lemma below its point of insertion and growth to the axis or rachilla.
- Capillary, hair-like.
Capitate, shaped like a head, crowded in a more or less spherical cluster.
Cartilaginous, hard and tough.
Chartaceous, papery.
Ciliate, hairy on the margins.
Conduplicate, folded together lengthwise.
Contracted, narrow, not spreading.
Coriaceous, leathery in texture.
Cuspidate, tipped with a short rigid point.
- Deciduous, falling at the end of the growing season.
Decumbent, stems and branches reclining but with the ends ascending.
Dichotomous, dividing regularly into two nearly equal parts.
Digitate, finger-like, diverging from a common point.
Dioecious, unisexual with pistillate and staminate flowers on separate plants.
Disarticulate, to disjoint or separate joint from joint.
Dorsal, on the back, or pertaining to the back.
- Ellipsoidal, shaped like an ellipse.
Emarginate, notched at the end.
Erose, irregularly margined as if gnawed.
Exserted, projected beyond the surrounding organs.
- Fertile, bearing seeds.
Filiform, long, slender and terete.
Flabellate, fanshaped.
Flexuous, alternately bent in different directions.
Foliaceous, leaf-like in texture or appearance.
Furcate, forked with terminal lobes which are like prongs.
- Geniculate, bent more or less like a knee.
Gibbous, swollen on one side.
Glabrous, without hairs.
Glaucous, covered with a white or bluish powdery-like bloom.
Glumes, the first two bracts of a grass spikelet.
- Hirsute, more or less covered with coarse stiff hairs.
Hispid, beset with bristly hairs or bristles.
Hispidulous, minutely hispid.
Hyaline, transparent or translucent.

Imbricate, overlapping as the shingles on a roof.

Indurate, hard.

Inflorescence, the flowering part of a plant; the mode of arrangement of the flowers on the floral stem

Inflated, bladdery, puffed up, swollen.

Internodes, that part of a stem or rachis between two successive joints.

Involute, a circle or collection of bracts surrounding a flower or a flower cluster.

Involute, rolled inward lengthwise.

Keeled, shaped like the keel of a boat

Lanceolate, lance shaped, much longer than broad, tapering from the middle or from below the middle.

Lemma, the lower of the two bracts inclosing a grass flower.

Ligule, a quite variable projection at the summit of the sheath next to the stem.

Linear, long, narrow with parallel margins.

Membranaceous, thin, rather soft, more or less translucent.

Monecious, with pistillate and staminate flowers on the same plant.

Mucronate, with a short, sharp, abrupt point.

Node, joint, the junction of two internodes.

Obovate, egg-shaped with the broad end outward.

Obtuse, blunt or rounded at the end.

Ovate, egg-shaped with the broad end inward.

Palea, the upper of the two bracts inclosing a grass flower.

Panicle, a loose or compact irregularly compound inflorescence.

Papillose, bearing minute nipple-shaped projections.

Paniculate, borne in, or resembling a panicle.

Pectinate, comb-like.

Pedicellate, borne upon a pedicel.

Pedicel, the support of a single flower or spikelet.

Peduncle, the stalk of a flower or flower cluster.

Pilose, hairy with long soft hairs.

Pistillate, bearing pistils but no stamens.

Plano-convex, flat on one side and rounded on the other.

Puberulent, minutely pubescent.

Pubescent, covered with short soft hairs.

Raceme, a simple inflorescence of pedicellate flowers borne upon a more or less elongated axis.

Racemose, in racemes or resembling racemes.

Rachilla, the axis of a spikelet.

Rachis, the axis of a spike or simple inflorescence.

Retrorse, pointing back or downward.

Rootstock, a slender horizontal underground stem.

Rugose, wrinkled.

Saccate, with a pouch or sac.

Scabrous, rough.

Scarios, thin, dry and translucent.

Secund, one sided or borne along one side of an axis.

Serrate, with sharp teeth pointing forward like saw teeth.

Serrulate, finely serrate.

Sessile, without a pedicel, attached directly.

Setaceous, bristlelike.

Sheath, the part of a grass leaf that is wrapped around the stem.

Solitary, single, not paired or clustered

Spicate, arranged in a spike, spike-like.

Spikelet, a flower cluster of grasses or sedges. It may consist of only one floret and the two glumes.

Staminate, bearing stamens and no pistils.

Stigma, that part of the pistil which is modified for the reception of pollen.

Stolon, a sucker, a runner which roots at the nodes .

Stoloniferous, producing stolons.

Striate, with the longitudinal lines or ridges.

Strict, straight, erect.

Subcylindric, almost cylindrical.

Subequal, almost equal.

Subtend, to extend under, located beneath.

Subulate, awl-shaped.

Terete, circular in cross-section.

Tillering, suckering or branching from the base of the stem.

Translucent, semi-transparent.

Transverse, crosswise.

Trifid, three-toothed, or three-parted.

Truncate, ending abruptly as though cut off, blunt on the end.

Tufted, growing in bunches.

Turgid, swollen.

Verticillate, with three or more similar parts radiating from a node; whorled.

Villose, bearing long soft hairs.

Viscid, glutinous, sticky.

Whorled, same as verticillate.

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