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A Flora of Wyoming

C. L. Porter

PART III
17. Poaceae (Gramineae) Grass Family

Agricultural Experiment Station
University of Wyoming, Laramie

June 1964
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PART III

17. Poaceae (Gramineae) Grass Family

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17. POACEAE (GRAMINEAE) Grass Family

Annual or perennial herbs, in ours. Stems often branched at the base, in perennials forming flowering stems (culms) and sterile shoots (innovations), the culms cylindrical, jointed, usually hollow in the internodes and closed in the nodes. Leaves sometimes crowded at the base of the plants, alternate and 2-ranked, each consisting of a sheath, a ligule, and a blade; sheaths with margins free or sometimes united; ligule at junction of sheath and blade, next to the stem, membranaceous or a fringe of hairs, rarely absent; blades usually linear, often involute, parallel-veined. Flowers usually perfect, small and inconspicuous, consisting of stamens and pistil and of 2 or 3 minute, hyaline or fleshy scales (lodicules) representing the perianth, each flower (floret) subsessile between two bracts (lemma and palea, the palea sometimes wanting), the whole forming a false flower. Florets (including sterile or empty lemmas) one to many, 2-ranked, sessile on a short and slender axis (rachilla), and bearing at the base two empty bracts (glumes), the florets and glumes together forming a spikelet. Spikelets pedicellate in open or contracted panicles or racemes (rarely solitary), or sessile in 1-sided or symmetrical spikes. Stamens usually 3, hypogynous, opening by longitudinal slits. Ovary 1-celled, with 1 ovule which is usually adnate to one side of the carpel; styles 2 in ours, and stigmas plumose. Fruit a grain or caryopsis, with a thin pericarp adnate to the seed, with starchy endosperm and a small, basal embryo.

As treated here in conventional manner, the family is divided into two subfamilies and these into tribes. The following tabular comparison will serve to distinguish the subfamilies, any two of the three differences being necessary to place the grass in its subfamily.

Subfamily 1. Festucoideae
Spikelets with 1 or more florets, the sterile florets, if any, usually above the fertile florets in the spikelet.
Articulation usually above the glumes and between the florets, the glumes remaining on the plant at maturity. Sometimes the articulation also in the axis of a spike.
Spikelets usually flattened laterally, the glumes and lemmas folded lengthwise, or sometimes rounded on the back.

Subfamily 2. Panicoideae
Spikelets with 1 perfect, terminal floret, and with 1 sterile floret below it.
Articulation always below the glumes, the whole spikelet falling from the plant at maturity, the glumes deciduous with the florets.
Spikelets flattened dorsally, the glumes and lemmas flat, or sometimes rounded on the back but never folded lengthwise.
SUBFAMILY 1. Festucoideae

KEY TO THE TRIBES

1. Inflorescence of one or more spikes, the spikelets sessile
2. Spike single and symmetrical, not 1-sided
3. Articulation above the glumes or in the rachis of the spike; spikelets often with prominent awns ........................................... 3. HORDEAE
4. Articulation below the glumes, not in the rachis; spikelets with inconspicuous awns .................................................. 7. ZOYSIEAE
5. Spikes 1 or more, each spike (or only the staminate spikes in dioecious plants) 1-sided, unsymmetrical .................................. 6. CHLORIDEEAE
6. Spikes 1 or more, each spike (or only the staminate spikes in dioecious plants) 1-sided, unsymmetrical

SUBFAMILY 2. Panicoideae

KEY TO THE TRIBES

1. Plants monocious, the male and female spikelets in separate inflorescences or in different parts of the same inflorescence .................................. 11. TRIPSACEAE
2. Spikelets in pairs, one sessile and fertile, the other sterile and pedicellate, or the sterile spikelet sometimes reduced to a mere pedicel; glumes indurate ................................................ 10. ANDROPOGONEAE
3. Spikelets not paired; glumes not indurate ....................................... 9. PANICEAE
Tribe 1. Festuceae  Fescue Tribe

Spikelets 2-several-flowered, in open, narrow, or spikelike panicles, rarely in racemes. Lemmas awnless, awned from the tip, or awned from between two minute teeth at the apex, the awns straight. Glumes shorter than the first lemma in the spikelet. Articulation above the glumes.

KEY TO THE GENERA

1. Tall, stout reeds 3-6 m. high, with plume-like panicles; rachilla with silky hairs as long as the lemmas .......................... 12. PHRAGMITES
2. Plants dioecious, the staminate and pistillate similar in appearance
   3. Rhizomes short or lacking; culms 4-8 dm. high, tufted; plants of mountain slopes, not in strongly alkaline places .................. 5. HESPEROCHLOA
   4. Lemmas 3-nerved
   5. Callus glabrous; plants seldom in dry, sandy areas
   6. Spikelets 3-several-flowered; lemmas acute or acuminate, greenish or purplish; plants not aquatic; annuals in ours ........ 7. ERAGROSTIS
   7. Spikelets mostly evenly distributed in narrow or open panicles; glumes not hispid-ciliate on the keel
   8. Callus of florets bearded with straight hairs
   9. Lemmas awned, bifid at the summit .................. 14. SCHIZACHNE
   9. Lemmas awnless, erose at the summit ............. 15. SCHLOCHLOA
   10. Upper florets of the spikelets reduced to club-shaped rudiments; culms often bulbous at base .................. 13. MELICA
10. All florets of the spikelet normal or rarely most or all of them transformed to bulblets; culms not bulbous at base

11. Spikelets 15 mm. long or more; lemmas usually awned from between the teeth of a minutely bidentate apex, sometimes awnless .................................................. 1. BROMUS

11. Spikelets smaller; lemmas awned from the tip or awnless

12. Nerves of lemma parallel, not converging near the summit

13. Nerves prominent and rib-like; plants of fresh water or moist places .................................................. 4. GLYCERIA

13. Nerves faint; plants of alkaline areas ........................................ 3. PUCCINELLA

12. Nerves of lemma converging near the summit

14. Lemmas awnless, keeled at least at the summit, blunt-pointed; leaves often boat-shaped at the tip ................................ 6. POA

14. Lemmas often awned, rounded on the back, slender-pointed; leaves tapering to a slender point ........................................ 2. FESTUCA

1. Bromus L. Bromegrass

Annual or perennial, low or often rather tall grasses, with closed sheaths, flat blades, and open or contracted, exserted panicles. Spikelets rather large, mostly 15 mm. long or more, several-flowered, strongly flattened or rounded, the articulation above the glumes and between the florets. Glumes unequal and shorter than the first lemmas. Lemmas convex on the back or sometimes keeled, 5-9-nerved, 2-toothed at the apex, and awnless or usually awned from between the teeth.

KEY TO THE SPECIES

1. Spikelets strongly flattened, the lemmas keeled (section Ceratochloa, with intergrading species)

2. Leaf-blades mostly 2-5 mm. wide, often involute, rather densely pilose; panicle narrow .................................................. 1. B. breviaristatus

2. Leaf-blades mostly 6-15 mm. wide, flat, glabrous to sparsely pilose; panicle more open

3. Sheaths retrorsely pilose; blades pubescent; spikelets pubescent .................................................. 2. B. marginatus

3. Sheaths glabrous; blades scabrous; spikelets glabrous or scaberulous .................................................. 3. B. polyanthus
1. Spikelets rounded to somewhat flattened, but the lemmas not keeled

4. Plants perennial (section Bromopsis)

5. Rhizomes present

6. Lemmas glabrous, awnless or with an awn not more than
   2 mm. long ........................................................................................................ 4. B. inermis

6. Lemmas pubescent on margins and across the back below, the awn 2-4 mm. long ........................................... 5. B. pumpellianus

5. Rhizomes lacking

7. Lemmas with a fringe of hairs on the margins and at the base, but sparsely hairy to glabrous on the back above

8. Ligule 3-5 mm. long; lemmas 8-10 mm. long, the awn
   6-8 mm. long ........................................................................................................ 6. B. vulgarris

8. Ligule about 1 mm. long; lemmas 10-15 mm. long, the awn
   3-5 mm. long ........................................................................................................ 7. B. ciliatus

7. Lemmas evenly pubescent over the back

9. Culms 7-12 dm. high; blades 5-15 mm. wide; panicle mostly 15-25 cm.
   long; first glume 1-nerved, second glume 3-nerved .......... 8. B. purgans

9. Culms 3-6 dm. high; blades 3-5 mm. wide; panicle mostly 8-15 cm.
   long; first glume 3-nerved, second glume 5-nerved ...... 9. B. anomalus

4. Plants annual

10. Folded lemmas about 3 times longer than wide, rounded above, not acuminate, the teeth mostly less than 1 mm. long (section Bromium)

11. Panicle narrow, with erect or ascending branches ........................................................................................................ 10. B. racemosus

11. Panicle open, with spreading or drooping branches

12. Lemmas awnless or with an awn less than 3 mm. long; mature spikelets mostly 8-10 mm. broad ..................... 11. B. brizaeformis

12. Lemmas with awns 6-12 mm. long; mature spikelets mostly 5-6 mm. broad

13. Foliage glabrous ........................................................................................................ 12. B. secalinus

13. Foliage pubescent

14. Awns straight; second glume
   7-nerved ........................................................................................................ 13. B. commutatus

14. Awns flexuous and curled at maturity; second glume 5-nerved ...................... 14. B. japonicus

10. Folded lemmas 6 or more times longer than wide, gradually acuminate, with a sharp callus at the base, the teeth 2-3 mm. long; awns 10-15 mm.
   long (section Bromus) .......................................................................................... 15. B. tectorum
1. **Bromus breviaristatus** Buckl.

Rather dry, often wooded slopes or open meadows, mostly at middle elevations in the mountains or mountain valleys, and generally distributed in Wyoming, although not seen from the southwestern part. Wyoming and western Montana to British Columbia, and southward to Nevada and California.

2. **Bromus marginatus** Nees

Open slopes, meadows, and wooded areas, mostly in the mountains at middle elevations, and well distributed in Wyoming. South Dakota and Alberta to British Columbia, and southward to New Mexico and California; introduced farther eastward.

3. **Bromus polyanthus** Scribn.

Open slopes, meadows, and wooded areas, mostly in the mountains at middle elevations, and fairly common in Wyoming. Montana to Washington, and southward to Texas and California.

4. **Bromus inermis** Leyss. Smooth Brome

Introduced as a hay and pasture crop at lower to middle elevations, and frequently established as an escape throughout most of Wyoming. Native of Europe.

5. **Bromus pumpellianus** Scribn.

This species is closely related to B. inermis, and by some is treated as a subspecies of that species (ssp. *pumpellianus* (Scribn.) Wagon). Plants with more densely pubescent lemmas have been segregated as var. *tweedyi* Scribn., based on a collection from Yellowstone National Park, and ranging from Alberta to Colorado.

Mostly in open meadows in mountainous areas of northern Wyoming, at middle elevations. Colorado and the Black Hills of South Dakota to Idaho and Alaska.

6. **Bromus vulgaris** (Hook.) Shear

Apparently infrequent, and seen only from northwestern Wyoming, in wooded, mountainous areas at middle elevations. Western Montana and northwestern Wyoming to British Columbia and California.

7. **Bromus ciliatus** L. Fringed Brome

Aspen woods, open parks, meadows, and stream banks, at middle elevations, and generally distributed in Wyoming except for the northeastern and southwestern parts. Newfoundland to Washington, and southward to Tennessee, western Texas, and California.
8. *Bromus purgans* L. Canada Brome

Wooded hills and thickets at middle elevations, our single record from Converse County, Massachusetts to Alberta, and southward to northern Florida and Arizona.


Rocky slopes and wooded areas in dry places, at middle elevations, and common throughout most of Wyoming. Saskatchewan and Idaho southward to western Texas, California, and Mexico.

10. *Bromus racemosus* L.

An infrequent weed in waste places and cultivated ground, mostly on the plains and foothills. Introduced from Europe, chiefly in western United States.

11. *Bromus brizaeformis* Fisch. & Mey. Rattlesnake Chess

Usually in dry, sandy soil as a weed, and perhaps occasionally cultivated as an ornamental, our two records from eastern Wyoming at lower to middle elevations. Introduced from Europe and found from Alaska and Canada southward to Delaware, Oklahoma, New Mexico, and California.

12. *Bromus secalinus* L. Chess, Cheat

Occasional as a weed in waste places and fields at mostly lower elevations in eastern Wyoming. Native of Europe and widely introduced in North America.


Fairly common as a weed in dry, waste places, fields, or roadsides, at lower to middle elevations. Not always clearly distinguishable from *B. racemosus*. Native of Europe and widely introduced in the northern United States.


A very common weed in dry, waste places, roadsides, and fields, at mostly lower to middle elevations, and most abundant throughout eastern Wyoming but spreading rapidly. Native of the Old World, and widely introduced in the northern United States and probably in southern Canada.

15. *Bromus tectorum* L. Downy Chess, Cheatgrass

One of the most abundant weeds in dry, waste ground, fields, and roadsides throughout most of Wyoming. Plants having glabrous
spikelets have been segregated as var. *glabratu* Spenner, and occur less commonly than the typical phase throughout its range. Native of Europe, and widely introduced in North America.

2. **Festuca L.**  
**Fescue**

Annuals or perennials with mostly narrow leaves and narrow or open and exerted panicles or racemes. Spikelets several-flowered, laterally flattened, the articulation above the glumes and between the florets. Glumes unequal, narrow, acute, the first usually 1-nerved, the second usually 3-nerved. Lemmas narrowly lanceolate, often terminally single-awned, 5-nerved, rounded on the back or sometimes slightly keeled. Palea 2-keeled, about as long as the lemma.

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**KEY TO THE SPECIES**

1. Plants annual and weedy, mostly at lower elevations; culms mostly 7-30 cm. high; panicle narrow and sometimes reduced to a raceme. 1. *F. octoflora*

1. Plants perennial, seldom weedy, at lower to higher elevations; culms low or tall; panicle various

2. Leaf blades mostly more than 3 mm. wide, flat

3. Lemmas with awns 5-20 mm. long. 2. *F. subulata*

3. Lemmas nearly or quite awnless

4. Rhizomes present; lemmas 5-7 mm. long. 3. *F. elatior*

4. Rhizomes lacking; lemmas 7-10 mm. long. 4. *F. arundinacea*

2. Leaf blades 2 mm. or less wide, mostly involute or folded

5. Lemmas awnless or nearly so

6. Ligule 2-4 mm. long. 5. *F. thurberi*

6. Ligule 1 mm. or less long. 6. *F. scabrella*

5. Lemma definitely awned

7. Culms decumbent, reddish and fibrillos e at the base. 7. *F. rubra*

7. Culms erect, seldom reddish or fibrillos e at the base

8. Awn of lemma mostly longer than the body of the lemma; leaves not scabrous. 8. *F. occidentalis*

8. Awn of lemma mostly shorter than the body of the lemma; leaves often scabrous
9. Culms mostly more than 40 cm. high; leaf blades often more than half the height of the culms, elongate; panicles mostly more than 10 cm. long, open ........................................ 9. *F. idahoensis*

9. Culms mostly less than 30 cm. high; leaf blades shorter; panicles mostly less than 10 cm. long, narrow

10. Culms glabrous; panicles not secund

11. Culms mostly 20-30 cm. high; foliage blue-green and often scabrous; plants of mostly lower elevations, seldom above timberline ........................................ 10. *F. ovina*

11. Culms mostly 5-20 cm. high; foliage green, not scabrous; plants of alpine situations, mostly above timberline 11. *F. brachyphylla*

10. Culms densely tomentulose (under a lens) below the panicle; panicle more or less secund; plants of alpine situations ........................................ 12. *F. baffinensis*

1. *Festuca octoflora* Walt. Six-weeks Fescue

   A common weed on prairies and plains, at lower to middle elevations, up to about 7,000 ft., mainly in the eastern half of Wyoming. Throughout the United States and southern Canada, extending southward to Lower California.

2. *Festuca subulata* Trin. Bearded Fescue

   Moist thickets in the mountains, and infrequent in Wyoming, having been seen only from the northwestern part. Southeastern Alaska to Wyoming, Utah, and northern California.

3. *Festuca elatior* L. Meadow Fescue

   Often cultivated in meadows and pastures, and sometimes locally established, at elevations up to about 8,000 ft. Native of Eurasia, and introduced throughout the northern United States and southern Canada.

4. *Festuca arundinacea* Schreb. Reed Fescue, Alta Fescue

   Known for Wyoming only from an experimental introduction at Laramie, but possibly grown locally in meadows. Rather widely introduced as a meadow or pasture grass in the northern United States. Native of Europe.

5. *Festuca thurberi* Vasey

   Dry hills at middle elevations, and infrequent in southeastern Wyoming. Central Rocky Mountains from Wyoming southward to Utah and New Mexico.
6. **Festuca scabrella** Torr.  Rough Fescue

The single Wyoming collection seen is from the eastern slope of the Big Horn Range, Johnson County (*Williams & Griffiths* 25, the type of *F. confinis* ssp. *rabisa* Piper.) The general aspect of the plant is like that of *Hesperochloa kingii* (S. Wats.) Rydb., which is dioecious. Newfoundland to British Columbia, and southward to North Dakota, Oregon, and Colorado.

7. **Festuca rubra** L.  Red Fescue

Two varieties occur in Wyoming: var. *lanuginosa* Mert. & Koch, with pubescent lemmas, and var. *commutata* Gaud., Chewing's Fescue, having more erect culms and forming a firmer sod, sometimes planted in new lawns.

Fairly common in scattered localities at lower to middle elevations in Wyoming, but not seen from the southeastern part. Throughout the cooler parts of the northern hemisphere, and extending southward in the mountains to Colorado and California; Eurasia and North Africa.

8. **Festuca occidentalis** Hook.  Western Fescue

Apparantly rare on dry or rocky slopes at middle elevations in northwestern Wyoming. Western Ontario and northern Michigan to British Columbia, and southward to Wyoming and central California.

9. **Festuca idahoensis** Elmer  Idaho Fescue

This species is closely related to *F. ovina* L., from which it may usually be distinguished by its taller culms, longer leaves, and more densely tufted habit.

Open or wooded slopes in the mountainous parts of Wyoming, and often the dominant grass at middle elevations in the northern part, but not known to occur in the northeastern part. Alberta to British Columbia, and southward to Colorado and California.

10. **Festuca ovina** L.  Sheep Fescue

A polymorphic species, similar in aspect to the preceding species, but usually lower in stature and with shorter leaves. The typical var. *ovina* has a rather open panicle; plants with narrow or spikeleike panicles found in subalpine situations are var. *saximontana* (Rydb.) Gleason. The high alpine, greatly reduced plants, with green, flatter blades, often regarded as ssp. *brachyphylla* (Schult.) Piper, are here treated as the following species.
Open meadows and slopes, from lower to middle elevations, and scattered throughout Wyoming. Widely distributed in North America, and extending southward to South Carolina, Illinois, New Mexico, and Arizona; Eurasia.

11. Festuca brachyphylla Schult. Alpine Fescue

Treated as a species here, this plant is often considered to be a subspecies of the polymorphic *F. ovina* L. Its very low stature, greener foliage with flatter blades, and alpine distribution are distinctive, while its narrow panicles resemble those of *F. ovina* var. *saximontana* (Rydb.) Gleason, a taller plant of less alpine situations. It is readily distinguished from *F. balfinensis* Polunin by its culms which are not densely tomentulose below the panicle, and by its narrower, not secund panicles.

Exposed, gravelly or rocky slopes above timberline, and fairly common in the high mountains of Wyoming. Circumpolar and arctic-alpine, extending southward to Wisconsin, Colorado, and California.

12. Festuca balfinensis Polunin Baffin Fescue

This species, resembling *F. brachyphylla* Schult. in general aspect, and also high alpine, is readily distinguished by its culms which are densely tomentulose (under a lens) in the upper part below the dense, ovoid, often secund panicles.

Occasional above timberline in the high mountains of Wyoming, in alpine tundra and exposed slopes. Arctic Alaska, across the Arctic Archipelago to Greenland, south to northern Hudson Bay, and on the high peaks of the Rocky Mountains to Wyoming.

3. Puccinellia Parl. Alkali-grass

Low, tufted, pale green perennials (in ours) of alkaline soils, with exserted, narrow or open panicles. Spikelets several-flowered, the articulation above the glumes and between the florets. Glumes unequal, shorter than the lemmas, the first usually 1-nerved, the second 3-nerved. Lemmas rounded on the back, acute or obtuse to truncate, often erose and papery at the summit, 5-nerved, the nerves parallel but not prominent. Palea about equaling the lemma.

KEY TO THE SPECIES

Lower panicle branches spreading or reflexed at maturity; glumes and lemmas truncate ........................................... 1. *P. distans*

Lower panicle branches erect or ascending; glumes and lemmas rounded or acute ........................................... 2. *P. airoides*
1. **Puccinellia distans** (L.) Parl.

Alkaline areas, mostly on the plains and in basins, at lower to middle elevations. Quebec to Alaska, and southward to Maryland, Michigan, North Dakota, New Mexico, and California; Eurasia.

2. **Puccinellia airoides** (Nutt.) Wats. & Coult.  

Nutall Alkali-grass  

Alkaline areas, mostly on the plains and in basins, and more common in Wyoming than the preceding species. Wisconsin to British Columbia, and southward to Kansas, New Mexico, and California; introduced in Maine and Vermont.

4. **Glyceria R. Br.**  

Mannagrass

Perennial, mostly tall grasses of fresh water marshes, with culms often rooting at the base, sometimes rhizomatous, the blades flat, and the panicles exserted, open or narrow. Spikelets several-flowered, rounded or laterally flattened, the articulation above the glumes and between the florets. Glumes unequal, shorter than the lemmas, obtuse or acute, usually 1-nerved. Lemmas convex on the back, firm, usually obtuse, with 5-9 strong, rib-like, parallel nerves.

**KEY TO THE SPECIES**

1. Spikelets linear, 10-15 mm. long, nearly terete ........................................ 1. *G. borealis*

1. Spikelets ovate to oblong, 6 mm. or less long, flattened

2. Lemmas with 5 strong and 2 faint nerves; second glume 3-nerved; sheaths open

3. Blades 5-15 mm. wide; culms erect ............................................... 2. *G. pauciflora*

3. Blades 1-3 mm. wide; culms weak and sprawling ................................... 3. *G. fernaldii*

2. Lemmas with 7 strong nerves; second glume 1-nerved; sheaths (at least the upper ones) closed

4. Blades mostly 2-5 mm. wide, rarely wider; first glume about 0.5 mm. long ........................................ 4. *G. striata*

4. Blades mostly 6-12 mm. wide; first glume 1-1.5 mm. long

5. First glume about 1 mm. long; spikelets 3-5 mm. long .......................... 5. *G. elata*

5. First glume about 1.5 mm. long; spikelets 5-6 mm. long ........... 6. *G. grandis*

1. **Glyceria borealis** (Nash) Batchelder  

Northern Mannagrass  

Moist meadows and stream banks, at middle elevations, and fairly common in Wyoming, but not seen from the northeastern part. New-
foundland to southeastern Alaska, and southward to Pennsylvania, Illinois, New Mexico, Arizona, and central California.

2. **Glyceria pauciflora** Presl.

Rather common in moist meadows and on stream banks, at middle elevations, up to about 9,500 ft., but not seen from northeastern or southwestern Wyoming. South Dakota to Alaska, and southward to New Mexico and California.

3. **Glyceria fernaldii** (Hitchc.) St. John

The only Wyoming collection seen is from beaver ponds near Moose, Teton County, at about 6,400 ft., a westward extension of the previously known range from Newfoundland to Minnesota, and southward to Pennsylvania.

4. **Glyceria striata** (Lam.) Hitchc. *Fowl Mannagrass*

Moist meadows, swamps, and stream banks, at lower to middle elevations, up to about 9,500 ft., and common throughout most of Wyoming. Newfoundland to British Columbia, and southward to northern Florida, Texas, and northern California.

5. **Glyceria elata** (Nash) Jones *Tall Mannagrass*

Moist meadows, swamps, and ponds, at middle elevations, up to about 9,500 ft., and seen from several localities in southeastern, northern, and northwestern Wyoming. Montana to British Columbia, and southward to New Mexico and California.

6. **Glyceria grandis** S. Wats. *American Mannagrass*

Common in swamps, around ponds, and in wet meadows, throughout most of Wyoming at lower to middle elevations. Across southern Canada to Alaska, and southward to Virginia, Tennessee, Iowa, Nebraska, New Mexico, Arizona, and eastern Oregon.

5. **Hesperochloa** *(Piper) Rydb.*

A rather coarse, tufted, dioecious, weakly rhizomatous perennial up to about 7 dm. high, with firm, flat or loosely involute, pale green, scabrous-margined blades 3-6 mm. wide, striate sheaths, and exserted, narrow panicles 7-20 cm. long, the two sexes similar in appearance but the staminate panicles somewhat denser and with spikelets a little longer. Spikelets plump but somewhat laterally flattened, 3-5 flowered, the articulation above the glumes and between the florets. Glumes subequal
or the second a little longer, shorter than the lemmas. Lemmas more or less keeled, acute, awnless, 5-nerved, scabrous, 5-8 mm. long. Palea as long as the lemma, scabrous-ciliate on the keels.

1. Hesperochloa kingii (S. Wats.) Rydb.

Common on dry, open slopes, usually in sandy soil, with sagebrush and in open pine forest; at middle elevations, in all but the eastern tier of Wyoming counties. Montana, western Nebraska, and Colorado westward to Oregon and California.

6. Poa L. Bluegrass

Low or tall, mostly erect grasses, with flat, folded, or involute blades that are boat-shaped apically, and with truncate to attenuate ligules. Panicles short to long, narrow and spikelike to open. Spikelets 2-several-flowered. Glumes usually keeled and shorter than the first floret, somewhat unequal. Lemmas keeled to rounded toward the base, mostly 5-nerved, the nerves only slightly convergent toward the apex.

Excellent forage grasses and often abundant on the short-grass plains and in alpine meadows. Poa pratensis, Kentucky Bluegrass, is extensively cultivated as a lawn and pasture grass.

KEY TO THE SECTIONS

1. Annuals ........................................ ANNUAE
1. Perennials ...........................................

2. Rhizomes present, well developed and often numerous ........ PRATENSES
2. Rhizomes lacking (culms decumbent and sometimes rooting at the base in P. palustris and P. glaucafolia)

3. Lemmas with cobwebby hairs tufted at the base (the web sometimes scanty in P. interior) .................................................. PALUSTRES
3. Lemmas not webbed (sometimes sparsely webbed in P. pateonii)

4. Spikelets flattened, the glumes and lemmas keeled ............... ALPINAE
4. Spikelets rounded, the glumes and lemmas obscurely keeled only near the tip .................................................. SCABRELLAE

1. Treatment for the genus Poa kindly contributed by Dr. D. D. Keck, National Science Foundation, Washington, D.C.
KEY TO THE SPECIES

Annuae

One species; an introduced weed .............................................. 1. *P. annua*

Pratenses

1. Culms flattened and 2-edged ............................................... 2. *P. compressa*

2. Culms terete

1. Panicle contracted, the branches stiffly ascending to erect ........ 3. *P. arida*

2. Panicle open, the branches spreading or reflexed

3. Lemmas webbed at the base

4. Ligule (on culm leaves) 1 mm. long, truncate; lemmas 2-3 mm. long ................................................................. 4. *P. pratensis*

4. Ligule 2-4 mm. long, obtuse or truncate; lemmas 3.5-5.5 mm. long

5. Lemma copiously webbed at the base with hairs to 3 mm. long ................................................................. 5. *P. longipila*

5. Lemma without a web or with a web of very few, short hairs

6. Lemmas not webbed, sometimes pubescent

6. Lower sheaths retrorsely pubescent and purple; rhizomes strongly developed; panicle open, heavy, 5-10 cm. long; spikelets rather loosely 3-8 flowered, commonly purplish; lemmas scabrous on nerves or throughout; florets all pistillate in Wyoming plants .......................... 7. *P. nervosa*

6. Lower sheaths smooth (rarely scabrid in *P. curta*), green; spikelets green; florets perfect

7. Lemmas broadly lanceolate, acute or obtuse, villous at least on the nerves or lower half; panicle erect; anthers 1.4-2.5 mm. long

8. Panicle 4-10 cm. long, loose or open (rarely nodding); culms 2.5 dm. high, loosely tufted .............................................. 6. *P. grayana*

8. Panicle 10-18 cm. long, narrow or more or less open; culms 4-9 dm. high, closely tufted .............................................. 8. *P. glaucifolia*

7. Lemmas lanceolate, sharply acute to acuminate, scabrid throughout and softly puberulent over the back toward the base or almost glabrous; panicle nodding, 7-35 cm. long, the lower branches at length reflexed; anthers 2.7-3 mm. long .............................................. 9. *P. curta*

Palustres

1. Lemmas glabrous except for sparse, silky pubescence on the keel and the web at the base, the nerves strong .............................................. 10. *P. trivialis*

1. Lemmas pubescent on the keel and marginal nerves, with a web at the base
2. Florets mostly converted into bulblets, usually dark purple with green tips; culm with a bulb-like base .................................................. 11. *P. bulbosa*

2. Florets not bulbiferous

3. Panicle nodding, open, with flexuous, capillary branches; blades short, flat, up to 4 mm. wide; anthers 0.4-0.9 mm. long

4. Glumes very unequal, the lower often more or less subulate; lemmas 3-4 mm. long, acuminate, the nerves pilose to glabrate below .................................................. 12. *P. leptocoma*

4. Glumes subequal, the lower rarely much narrower than the upper; lemmas 2-3 mm. long, acute, the nerves more densely pilose ............... 13. *P. reflexa*

3. Panicle not nodding nor with flexuous branches

5. Culms 5-12 dm. high, loosely tufted; panicle pyramidal, ample, 15-30 cm. long

6. Ligule 1.5-3 mm. long; blades 3-7 mm. wide; lemmas 3-5 mm. long; anthers 1.8-3 mm. long .................................................. 14. *P. tracyi*

6. Ligule 3-5 mm. long; blades 1-3 mm. wide; lemmas 2.5-3 mm. long, more or less bronze-colored .................................................. 15. *P. palustris*

5. Culms 2-5 dm. high, densely tufted; ligule 0.5-1.5 mm. long; panicle 5-15 cm. long, with short, ascending branches; lemmas sometimes only scantily webbed .................................................. 16. *P. interior*

**Alpinae**

1. Lemmas pubescent at least on the keel and marginal nerves

2. Leaves glaucescent, stiffish, the basal blades often folded or involute, the culm blades very short and appressed or obsolete, the ligule extremely variable, from less than 1 mm. long and truncate to 12 mm. long and acuminate; panicle pale; middle elevations .................................................. 17. *P. fendleriana*

2. Leaves green, the culm blades never obsolete; panicle purplish; alpine

3. Panicle about as broad as long; spikelets broadly ovate in outline; blades flat .................................................. 18. *P. alpina*

3. Panicle longer than broad; spikelets narrower; blades folded or involute

4. Culms not much exceeding the crowded, basal leaves; lemmas 4-5 mm. long, strongly pubescent on the keel and marginal nerves and sometimes sparsely webbed; anthers 0.7-1 mm. long .................................................. 19. *P. pattersonii*

4. Culms much exceeding the basal leaves; lemmas about 3 mm. long, silky on the keel and marginal nerves, not webbed; anthers 1.1-1.5 mm. long .................................................. 20. *P. rupicola*

1. Lemmas glabrous (except in subsp. of *P. cusickii*)

5. Tufted dwarf 3-10 cm. high; spikelets 3-4 mm. long; lemmas 2-3 mm. long; above treeline .................................................. 21. *P. lettermanii*
5. Tufted but 15-50 cm. high; spikelets 5-7.5 mm. long; lemmas 4-5.5 mm. long

6. Blades filiform to capillary, more or less scabrid; panicle usually pallid and shining; middle elevations ........................................ 22. P. cusickii

6. Blades mostly wider, smooth, bright green; panicle green or purplish; high elevations ............................................................. 23. P. epilis

Scabrellae

1. Lemmas more or less hairy on the back, keel, or nerves, at least toward the base, sometimes obscurely so

2. Spring-flowering and more or less ephemeral, summer-dormant; typically in small tufts with erect or divergent, capillary culms much exceeding the short, basal leaves, and less than 3 dm. high; moderate elevations .... 24. P. sandbergii

2. Summer-flowering and summer-active; middle to high elevations

3. Panicle contracted

4. Culms 4-12 dm. high; panicle 6-15 cm. long; spikelets 3-6-flowered, 5-9 mm. long; lemmas crisp-puberulent in the lower half on nerves or over the rounded back ................................................................. 25. P. canbyi

4. Culms 1.5-3 dm. high; panicle mostly 5-8 cm. long; spikelets 2-4-flowered, 5-7 mm. long; lemmas often scabrid apically, the crisp-puberulence often limited to the very base ......................................................... 26. P. incurvata

3. Panicle open, the lower branches at right angles to the axis ......................................................................................... 27. P. gracillima

1. Lemmas more or less scabrous apically or throughout

5. Ligule of upper leaves 3-6 mm. long, acute or acuminate; sheaths and blades often scabrous, the blades usually folded or involute, bright green or pale; plants of meadows .............................................................. 28. P. nevadensis

5. Ligule 1-2 mm. long, rounded or obtuse; sheaths smooth (or scabrid); plants of drier slopes

6. Blades tightly involute, greenish, 1-2 dm. long; plants often in alkaline soils ............................................................................. 29. P. juncifolia

6. Blades flat, usually glaucous, 2-5 dm. long; plants in non-alkaline soils .................................................................................. 30. P. ampla

1. Poa annua L. Annual Bluegrass

An introduced weed in gardens, lawns, and waste places, at lower and middle elevations. Widespread across the continent from Newfoundland to Alaska, and from Florida to California, southward to tropical America; introduced from Europe.

2. Poa compressa L. Canada Bluegrass

Old meadows, cultivated ground, and waste places, forming rather sparse sod, at lower and middle elevations, up to 8,000 ft. New-
foundland to Alaska, and southward to the Gulf States and New Mexico, and westward to California; introduced from Europe.

3. **Poa arida** Vasey  Plains Bluegrass

Frequent on dry plains, alkaline meadows, and hills, at lower to middle elevations, below 8,000 ft. Manitoba to Alberta, and southward to western Iowa, Texas, and northern Arizona.

4. **Poa pratensis** L.  Kentucky Bluegrass

Widespread in meadows, lawns, open, moist ground, and open woods, throughout the United States and southern Canada, including Alaska; Eurasia; many races introduced from the Old World as pasture grasses.

5. **Poa longipila** Nash

Occasional in dry or moist meadows or rocky ridges and alpine slopes, usually in the open, up to 12,000 ft. Rocky Mountains from Jasper Park, Alberta, to Pikes Peak, Colorado; also in the Big Horn Range, Wyoming, the La Plata Mountains, Colorado, the Uinta Mountains, Utah, and the Ruby Mountains, Nevada. **Type locality:** Electric Peak, Yellowstone National Park, *Rydberg 3614*. This species and the following one were lumped under *P. arctica* R. Br. by Hitchcock in the Manual of the Grasses of the United States.

6. **Poa grayana** Vasey

Rare, on moist, rocky, mountain sides or alpine meadows, up to 12,000 ft. Rocky Mountains, from Jasper Park, Alberta, to New Mexico and Utah.

7. **Poa nervosa** (Hook.) Vasey

Common in well drained meadows, open woods, ridges, and grassy slopes, mostly at 8,000-11,000 ft. Western Alberta and southern British Columbia southward through the mountains to southern Colorado, Utah, and California.

8. **Poa glaucifolia** Scribn. & Will.

Rare, in rather moist soil on meadow margins, stream banks, wooded bottoms, and pine woods, mostly below 8,500 ft. Saskatchewan to British Columbia, and southward to western Nebraska, central Colorado, and eastern Idaho. **Type locality:** Spring Creek, Big Horn Basin, Wyoming, *Williams 2814*. This species combines the characters of *P. grayana*, *P. canbyi*, and *P. ampla*.
9. **Poa curta** Rydb.

Moist, light soils, often under aspen or in spruce-fir woods, at 5,000-9,500 ft. Teton County, Wyoming (type locality Spread Creek, *Tweedty 13*) and adjacent Idaho to the central Wasatch Mountains, Utah.

10. **Poa trivialis** L. **Rough Bluegrass**

Moist, often shady ground. A European introduction found across the United States but nearly always at low elevations and very rare in the Rocky Mountain states. Not definitely reported as yet from Wyoming, but a possible migrant.

11. **Poa bulbosa** L. **Bulbous Bluegrass**

Pastures and disturbed land, at lower to middle elevations, about 4,000-6,000 ft. A European introduction, mainly in northeastern Wyoming; scattered across the United States but mostly absent from the Mississippi Valley and the southern tier of states.

12. **Poa leptocoma** Trin. **Bog Bluegrass**

Boggy meadows and thickets in the mountains, mostly at about 7,000-11,000 ft. The tall form, with narrow glumes and lemmas, which matches the type from Sitka, Alaska, is rare in Wyoming as is the more slender, dwarf phase of the species, with somewhat broader glumes and lemmas, that has gone under the name of *P. paucispicula* Scribn. & Merr. The latter form also ranges northward to Alaska; the tall form extends southward to New Mexico and westward to California.

13. **Poa reflexa** Vasey & Scribn. **Nodding Bluegrass**

Stream banks, boggy meadows, and moist ground of open woods, from 8,000-12,000 ft.; frequent from western Montana southward to southern Colorado, northern Arizona, and eastern Nevada, but not in the Big Horn Range nor in Idaho. The species is closely related to *P. leptocoma*, and although tending to be more alpine in distribution, it frequently grows with it, and so the two are scarcely separated ecologically.

14. **Poa tracyi** Vasey

Moist ground, at 4,500-9,000 ft., on both sides of the Continental Divide, from southern Wyoming, where rare, to northern New Mexico. *Poa occidentalis* (Vasey) Rydb.
15. *Poa palustris* L.  Fowl Bluegrass

Moist meadows and ditches, open ground, mostly at 5,000-8,000 ft.; circumpolar, from Newfoundland and Quebec to Alaska, and southward to Virginia, Missouri, New Mexico, and California; Eurasia.

16. *Poa interior* Rydb.  Inland Bluegrass

Open or forested, relatively dry slopes and meadows in the mountains, from mid-elevations to timberline. Ranging from Mackenzie to western Ontario and British Columbia, and Lake Superior to eastern Washington, and southward through the Dakotas and the Rocky Mountain states to northern New Mexico and Arizona. Type locality: headwaters of Clear Creek and Crazy Woman River, Johnson County, Wyoming, *Tweed 3706*. *Poa subtrivialis* Rydb., from the Big Horn Range, 1909, *Tweed 2141*, is a synonym.

17. *Poa fendleriana* (Steud.) Vasey  Muttongrass

Common in montane regions on dry, often rocky slopes and meadows, at mostly 5,000-8,000 ft. Black Hills to Oklahoma and northern Chihuahua, and westward to British Columbia and southern California. The typical form is short-liguled, but the ligule varies throughout the range of the species, as indicated in the key, without other morphological or ecological correlation. This makes specific retention of the long-liguled form, *P. longiligula* Scribn. & Will., and the var. *wyomingensis* Williams, from Tipton, Sweetwater County, Wyoming, *A. Nelson 4799a*, untenable. *Poa longepedunculata* Scribn., from Laramie, *A. Nelson 3292*, and its var. *viridecens* Williams, from Sheep Mountain, Albany County, Wyoming, *Williams 2302*, are additional synonyms.

18. *Poa alpina* L.  Alpine Bluegrass

Moist or dryish meadows, lake shores, rocky outcrops, or talus slopes, at mostly 9,000-11,500 ft. In the Alpine Zone from southern Colorado, the Uinta Mountains, Utah, the Wallowa Mountains, Oregon, and the Cascades of northern Washington northward to the Arctic; Alaska to Greenland; northern Eurasia.

19. *Poa Pattersonii* Vasey  Patterson Bluegrass

Rare on open, rocky slopes near treeline, at 10,000-12,000 ft. Rocky Mountains, from British Columbia to Colorado, and the Uinta and La Sal mountains, Utah.

20. *Poa rupicola* Nash  Timberline Bluegrass

Principally on rocky screes and ridges above timberline, also in subalpine meadows, at 9,000-11,500 ft. Rocky Mountains, from Al-
be rta and British Columbia to New Mexico, and westward to southern Utah and California.

21. Poa lettermanii Vasey  Letterman Bluegrass
Rocky or grassy slopes above treeline. Widely scattered on alpine peaks, and in Wyoming known only from the Beartooth Plateau in northern Park County, and from the Wind River Range, Fremont County. British Columbia, Washington, Colorado, Utah, Nevada, and California.

22. Poa cusickii Vasey  Cusick Bluegrass
Moist or rather dry meadows, grassy slopes, and sagebrush plains, usually in open stands, at about 6,000-10,500 ft. Saskatchewan to British Columbia, and southward to Colorado, Utah, Nevada, and central California. Poa subaristata Scribn., not Phil., from Yellowstone National Park, Tweedy 633, is a synonym.

22a. Poa cusickii subsp. pubens Keck, subsp. nov.
A subsp. cusickii differ: lemma e basi moderate pilosa. The keel is scabrous apically as in subsp. cusickii, but the soft, short pubescence of the lower half of the lemma extends to all parts and is not confined to the nerves. Type: Orendo Butte, on the sandy plain of the Red Desert, Sweetwater County, Wyoming, June 11, 1900, Aven Nelson 7130 (US; isotypes, RM, US). Three other collections of this subspecies from Sweetwater County are from Sand Creek, June 2, 1900, Aven Nelson 7036; Pilot Butte, June 14, 1937, Lang & Stevens 32; and Table Mountain, June 20, 1937, Lang & Stevens 44.
Poa cusickii is highly variable, but with the one exception noted above it is not readily separable into regional subunits. The spring-flowering forms of low or moderate elevations are without doubt physiologically different from the forms that ascend to 11,000 ft. and bloom in August in parts of the Rockies and in Idaho. The more western representatives of the species tend to have more scabrous herbage and a looser inflorescence, but no attempt is made to maintain the names that have been given to certain of these trends.

23. Poa epilis Scribn.  Skyline Bluegrass
Gravelly or rocky ridges or slopes, or dryish meadows, mostly above treeline, at 8,400-12,000 ft. Alberta and British Columbia southward to Colorado, Utah, Nevada, and California.

24. Poa sandbergii Vasey  Sandberg Bluegrass
Common on shallow or rocky soils of open plains or hillsides, often with sagebrush, mostly below 6,000 ft. Saskatchewan to British Co-
lumbia, and southward to western Nebraska, Colorado, Utah, Nevada, and eastern California.

Variable, but typically a shallow-rooted, ephemeral plant of the spring season, important as forage for sheep enroute to higher elevations for the summer. Formerly widely known as *P. secunda* Presl, a different grass from coastal Chile.

25. **Poa canbyi** (Scribn.) Piper Canby Bluegrass

Common on open, rocky or grassy slopes and prairies, at middle to higher elevations, 6,000-11,000 ft. Saskatchewan to British Columbia, and southward to southern Colorado and Utah, Nevada, and northern California. *Poa wyomingensis* Scribn., from Big Horn, Sheridan County, *Pammel 192*, is conspecific.

26. **Poa incurva** Scribn. & Will.

Exposed, rocky ridges and slopes, rarely in open woods, at 8,000-11,000 ft. Alberta and British Columbia southward to Wyoming (Teton, Gros Ventre, and Wind River ranges and the Beartooth Plateau), and through the Cascades to southern Nevada and southern California.

The species is best comprehended as the alpine counterpart of the mid-altitude *Poa canbyi*. It is facultatively apomictic, as are the other bunchgrass *poas*.

27. **Poa gracillima** Vasey Slender Bluegrass

Open, rocky or gravelly slopes, or in rather dry, alpine meadows, rarely forming close stands, at 9,000-11,000 ft. Alberta and British Columbia southward through the Rocky Mountains to Utah, and westward to the Cascades and Sierra Nevada from Washington to California. Limited in Wyoming to the Jackson Hole region, Teton County.

28. **Poa nevadensis** Vasey Nevada Bluegrass

Moist meadows and bottoms in fertile soils of plains and foothills, formerly in extensive stands at 6,000-9,000 ft. Montana southward to Colorado and Arizona, and westward to eastern Washington and through the Great Basin to eastern California. Much overgrazed but very valuable as range forage. In Wyoming intergrading to some extent with *P. juncifolia* and *P. ampla*, but the long ligule is usually distinctive as is the habitat.

29. **Poa juncifolia** Scribn. Alkali Bluegrass

Common in moist or dry, alkaline or silty meadows and slopes, often with sagebrush, at 6,000-8,500 ft. British Columbia to Colorado,
and westward to eastern Washington and northern California. Type locality: Point of Rocks, Sweetwater County, A. Nelson 3721.

29a. Poa juncifolia subsp. porteri Keck, subsp. nov.

A subsp. juncifolia different: culmis tenuioribus, lemmas in infero dimidio minute pubescentibus. Type: Pole Mountain region, in dry, gravelly soil, 8,400 ft. elevation, Albany County, Wyoming, July 6, 1943, C. L. Porter 3249 (NY; isotypes CI, RM).

This new subspecies includes much of the material in the northeastern part of the general range of P. juncifolia. It occurs from Saskatchewan and Alberta, through North Dakota and eastern and southern Wyoming, to central Colorado.

30. Poa ampla Merr. Big Bluegrass

Common in prairies, open hillsides, or open pine or aspen forest, in rich, light, rather dry soils, at mid-altitudes, 4,600-9,500 ft. Alberta and southern British Columbia southward through the mountains to New Mexico, and through the Great Basin to Arizona and California.

The typical, glaucous, robust form of the species occurs in northwestern Wyoming. This intergrades southward with the greener, less robust form called P. confusa Rydb. (type: Medicine Bow Range, A. Nelson 7787) which is conspecific.

7. Eragrostis Beauv. Lovegrass

Annuals, in ours, with exserted panicles. Spikelets several- to many-flowered, the florets imbricated and strongly flattened laterally, the articulation above the glumes and between the florets. Glumes slightly unequal, shorter than the lemmas, acute or acuminate, mostly 1-nerved. Lemmas acute or acuminate, keeled, 3-nerved, the lateral nerves sometimes obscure. Palea nearly as long as the lemma, 2-keeled, often persistent. Fresh plants sometimes malodorous.

KEY TO THE SPECIES

1. Plants creeping and rooting at the nodes, forming mats in wet places .............................................................................. 1. E. hypnoides
2. Glandular pits present below the nodes and on the keels of some of the lemmas
3. Spikelets mostly 3-4 mm. wide ............................................. 2. E. cilianensis

— 24 —
1. *Eragrostis hypnoides* (Lam.) B.S.P.

Seen only from Sheridan County, along a small stream, at about 3,500 ft. Quebec to Washington, and southward through Mexico to Argentina; West Indies.

2. *Eragrostis ciliaris* (All.) Lutati  

Stinkgrass

A fairly common weed in dry, sandy soils, at mostly lower elevations, and most abundant in southeastern Wyoming, but seen also from the Big Horn Basin in north-central Wyoming. Widely introduced into the New World from the Old World.

3. *Eragrostis poaeoides* Beauv. ex R. & S.

The single collection from Wyoming came from the University campus at Laramie, Albany County, at 7,200 ft., but the species may be present elsewhere as an occasional weed. Introduced from Europe, and found in scattered localities across the United States.


A weed in fields and waste ground at mostly lower elevations in southeastern Wyoming. Wyoming and Idaho southward to Oklahoma, Texas, Nevada, and southern California; introduced in the eastern United States; Mexico.

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8. *Catabrosa Beauv.*  

Brookgrass

Perennial grasses of fresh-water streams and ponds, the culms 10-50 cm. long, decumbent from a creeping base, sometimes floating, the blades soft and flat, and the panicles erect, open, and exerted. Spikelets usually 2-flowered, the articulation above the glumes and between the florets. Glumes unequal, shorter than the lower floret. Lemmas 2-3 mm. long, with 3 strong and parallel nerves, yellowish or brownish at maturity, the apex rounded, pale and scarious.

1. *Catabrosa aquatica* (L.) Beauv.

Common in sluggish streams and in ponds, at lower to middle elevations, throughout most of Wyoming, up to about 9,000 ft. Circumboreal, and southward in the United States to Wisconsin, South Dakota, Colorado, northern Arizona, and Nevada.
9. Redfieldia Vasey Blowout-grass

A rather coarse, tall perennial of sandy areas, with creeping rhizomes, the culms 6-10 dm. high, and the panicles large and diffuse, mostly 2-4 dm. long. Spikelets laterally flattened, 3-4-flowered, the articulation above the glumes and between the florets. Glumes somewhat unequal, acuminate, 1-nerved, shorter than the first lemma in the spikelet. Lemma with 3 parallel nerves that are densely villous at the base, acute or mucronate, 4-5 mm. long. Palea about as long as the lemma.

1. Redfieldia flexuosa (Thurb.) Vasey

Dry, sandy soils at lower to middle elevations, up to about 6,000 ft., in central Wyoming. North Dakota and Wyoming to Utah, and southward to Oklahoma, New Mexico, and Arizona.

10. Distichlis Raf. Saltgrass

Low, perennial, dioecious grasses of alkaline soils, the sexes similar in appearance, the plants with extensive, creeping rhizomes, the culms in ours mostly 1-3 dm. high, the leaves somewhat distichous and pale green, and the panicles congested, more or less exserted, straw-colored when mature, and 1-6 cm. long. Spikelets about 14 mm. long, 9-15-flowered, strongly laterally flattened, glabrous, the articulation above the glumes and between the florets. Glumes unequal, keeled, 3-7-nerved. Lemmas imbricated, acute, keeled, with 9-11 faint nerves. Palea a little shorter than the lemma.

1. Distichlis stricta (Torr.) Rydb. Desert Saltgrass

Common and often forming an extensive sod in alkaline areas on the plains and in the basins throughout most of Wyoming, at elevations up to about 8,000 ft. Wisconsin and Saskatchewan to eastern Washington, and southward to Texas, California, and Mexico.

11. Dactylis L. Orchard Grass

A tall perennial 6-12 dm. high, often in large tussocks, with flat blades, the stiff, open panicles 5-20 cm. long and having branches that are naked below and with spikelets densely crowded in somewhat 1-sided clusters at their ends. Spikelets mostly 3-5-flowered, laterally flattened, the articulation above the glumes and between the florets. Glumes unequal, keeled, hispid-ciliate on the keel. Lemmas keeled, mucronate, 5-nerved, 6-7 mm. long, ciliate on the keel. Palea shorter than the lemma.
1. **Dactylis glomerata** L.

Roadsides, fields, and meadows, at lower to middle elevations, up to about 8,000 ft., and occasional throughout most of Wyoming. Native of Eurasia, and widely introduced in North America.

12. **Phragmites** Trin. Common Reed

A perennial reed of marshes, lakes, and streams, with erect culms 2-4 m. high, flat blades 1-5 cm. wide, and large, plume-like panicles 15-40 cm. long. Spikelets several-flowered, 12-15 mm. long, with silky hairs produced from the rachilla, the articulation above the glumes and between the florets. Glumes 3-5-nerved, lanceolate, acute, the first about half as long as the second which is shorter than the florets in the spikelet. Lemmas long-acuminate, glabrous, 3-nerved. Palea much shorter than the lemma.

1. **Phragmites communis** Trin.

Moist ditches and margins of lakes, at lower to middle elevations, up to about 7,000 ft., and generally distributed in Wyoming. Nova Scotia to British Columbia, and southward to Florida, Mexico, the West Indies, Chile, and Argentina; Eurasia, Africa, Australia.

13. **Melica** L. Melicgrass

Rather tall perennials, with the base of the culms often swollen into a small, onion-like corm, the blades mostly flat, and the exserted panicles narrow or open. Spikelets often purplish, 2-several-flowered, the lower florets perfect and the upper florets gradually reduced to small, empty lemmas, these usually rolled together. Articulation above the glumes and between the florets. Glumes somewhat unequal, thin and usually papery, nearly as long as the lowest floret or shorter, 3-5-nerved. Lemmas convex, mostly 7-nerved, with scarious margins, awnless or awned from between the teeth of a minutely bifid apex. Palea much shorter than the lemma.

**KEY TO THE SPECIES**

Lemmas with an awn 3-5 mm. long; blades 6-12 mm. wide ........................................ 1. **M. smithii**

Lemmas awnless; blades 2-6 mm. wide

Lemmas acuminate, slender-pointed ................................................................. 2. **M. subulata**

Lemmas obtuse
Bulb stipitate, not sessile on the rhizome; first glume 3.5-5.5 (av. 5) mm. long 3. *Melica spectabilis*

Bulb sessile on the rhizome; first glume 5-9 (av. 7) mm. long 4. *Melica bulbosa*

1. **Melica smithii** (Porter) Vasey Smith Melic

Cool, moist, usually wooded areas, at about 6,000-7,000 ft., in northwestern Wyoming. Western Ontario and northern Michigan to British Columbia, and southward to northwestern Wyoming, Montana, and Oregon.

2. **Melica subulata** (Griseb.) Scribn. Alaska Oniongrass

Apparently rare in moist woods and on shaded slopes, at middle elevations, in northern and western Wyoming. Montana to Alaska, and southward in the mountains to Wyoming, Idaho, and central California; Chile.

3. **Melica spectabilis** Scribn. Purple Oniongrass

Meadows and open hillsides, at middle and higher elevations, up to about 10,000 ft., and fairly common in Wyoming except in the northeastern and southwestern parts. Montana to British Columbia, and southward to Colorado and northern California.

4. **Melica bulbosa** Geyer ex Porter & Coulter Oniongrass

Meadows and open hillsides, at middle and higher elevations, up to about 10,000 ft., and well distributed in Wyoming except in the northeastern part. Montana to British Columbia, and southward to Colorado, western Texas, and California.

**14. Schizachne** Hack. False Melic

A perennial with culms 5-10 dm. high, flat blades, and open, few-flowered panicles about 1 dm. long. Spikelets several-flowered, 20-25 mm. long, the articulation above the glumes and between the florets. Glumes unequal, the first 3-nerved, the second 5-nerved. Lemmas lanceolate, strongly 7-nerved, awned from between two prominent teeth of the bifid apex, about 1 cm. long, the awn 10-15 mm. long, the callus bearing a tuft of hairs but the rachilla glabrous.

1. **Schizachne purpurascens** (Torr.) Swallen

Open, wooded areas, at middle elevations, mostly 5,000-9,000 ft., and infrequent at widely scattered localities in Wyoming. Newfoundland to southern Alaska, and southward to Maryland, Kentucky, South Dakota, and New Mexico; Siberia, Japan.
15. Scolochloa Link

A tall perennial of moist places, 10-15 dm. high, with fleshy rhizomes, flat blades 5-10 mm. wide and tapering to a slender point, and open panicles 15-20 cm. long. Spikelets 3-4-flowered, the articulation above the glumes and between the florets. Glumes subequal, somewhat scarios and lacerate at the tip, about as long as the first lemma, the first 3-nerved, the second 5-nerved. Lemmas firm, rounded on the back, villous on the callus, rather faintly 7-nerved, the apex scarios and lacerate. Palea narrow and flat, about as long as the lemma.

1. Scolochloa festuacea (Willd.) Link

Moist places, often in the water, in ditches and margins of ponds and lakes, at middle elevations, our single record from Yellowstone National Park. Manitoba to British Columbia, and southward to northern Iowa, Nebraska, Wyoming, and eastern Oregon; northern Eurasia.

Tribe 2. Aveneae Oat Tribe

Spikelets 2-several-flowered, in open, narrow, or spikelike panicles, rarely in racemes, and rarely solitary. Lemmas awned from the back (dorsally), sometimes awned from between the teeth of a bidentate apex, the awn straight or often bent (geniculate) and twisted, or sometimes the lemmas awnless. Glumes at least equaling the first lemma in length and often much longer. Callus and rachilla often hairy. Articulation above or below the glumes.

KEY TO THE GENERA

1. Glumes 7 mm. long or less; spikelets 2.5-7 mm. long; rachilla prolonged above the terminal floret

2. Articulation below the glumes which are very unequal in width; spikelets 2.5-4 mm. long .............................................. 16. SPHENOPHOLIS

2. Articulation above the glumes which are not very unequal in width; spikelets 4-7 mm. long

3. Lemmas convex on the back, not keeled ............................................. 17. DESCHAMPSIA

3. Lemmas keeled on the back

4. Lemmas bearded at the base with very short, stiff hairs, usually awned, the apex bidentate ............................................. 18. TRISETUM

4. Lemmas not bearded, usually awnless, the apex not bidentate ............................................. 19. KOELERIA

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1. Glumes 10 mm. or more long; spikelets 10-25 mm. long; rachilla not prolonged above the terminal floret

5. Lemmas awned from the back

6. Annuals; glumes more than 12 mm. long ........................................... 20. AVENA

6. Perennials; glumes 10-12 mm. long ........................................... 21. HELICTOTRICHON

5. Lemmas awned from between 2 terminal teeth .......... 22. DANTHONIA

16. Sphenopholis Scribn. Wedgegrass

Slender perennials (rarely annual) with usually flat blades and shining, contracted or somewhat open panicles. Spikelets 2-3-flowered, laterally flattened, the articulation below the glumes. Rachilla prolonged beyond the upper floret as a slender bristle. Glumes about equaling the first lemma, subequal in length, very unequal in width, the first narrowly lanceolate, the second broadly obovate. Lemmas usually awnless, the awn, when present, dorsal from just below the tip.

KEY TO THE SPECIES

Panicle narrow, spikelike; second glume nearly as wide as long .................. 1. S. obtusata

Panicle open, nodding, lax; second glume nearly three times longer than wide ........................................... 2. S. intermedia

1. Sphenopholis obtusata (Michx.) Scribn. Prairie Wedgegrass

Prairies and foothills, at lower to middle elevations, up to about 8,000 ft., and widely scattered in Wyoming. Maine to British Columbia, and southward to Florida, Arizona, and California; Mexico and the Dominican Republic.

2. Sphenopholis intermedia (Rydb.) Rydb. Slender Wedgegrass

Moist meadows and valleys, at middle elevations, up to about 8,000 ft., and widely scattered in Wyoming. Newfoundland to British Columbia and Alaska, and southward to Florida and Arizona.

17. Deschampsia Beauv. Hairgrass

Perennials or sometimes annuals, with flat, folded, involute, or capillary blades and pale or purplish, shining, narrow or open panicles. Spikelets 2-flowered, laterally flattened, the articulation above the glumes. Rachilla prolonged beyond the upper floret as a hairy bristle. Glumes

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subequal in length and shape, usually equaling or exceeding the florets, membranaceous and acute. Lemmas convex on the back, truncate and 2-4-toothed at the apex, bearded at the base, and bearing a straight or bent, dorsal awn from the middle or below.

**KEY TO THE SPECIES**

Annual with few leaves ........................................ 1. *D. danthonioides*

Perennials with numerous leaves

Blades flat, involute, or folded, but not capillary; panicles open

- Glumes exceeding the terminal floret by 1-2 mm. .......... 2. *D. atropurpurea*
- Glumes equaling the terminal floret or shorter .......... 3. *D. caespitosa*

Blades usually capillary; panicles narrow .................. 4. *D. elongata*

1. *Deschampsia danthonioides* (Trin.) Munro ex Benth. Annual Hairgrass

A weedy annual in sagebrush or in dry, open ground, known for Wyoming only from the extreme northwestern part, at middle elevations. Montana to Alaska, and southward to Arizona and Baja California; Chile.

2. *Deschampsia atropurpurea* (Wahl.) Scheele Mountain Hairgrass

Moist meadows and tundra, mostly at higher elevations, up to about 11,000 ft., in southeastern and northwestern Wyoming. Newfoundland and Labrador to Alaska, and southward to New Hampshire, Colorado, Idaho, and California; northern Eurasia.

3. *Deschampsia caespitosa* (L.) Beauv. Tufted Hairgrass

Collections seem to be of two sorts: one the common and relatively tall, typical form: the other, from northwestern Wyoming, a plant closely resembling *D. brevifolia* R. Br., an arctic species with culms 5-10 cm. high, and with narrow, purplish panicles. Two collections of the latter type have been seen, one from the high Beartooth Plateau, and the other from the high Wind River Range.

Rather moist places in the mountains and foothills, at middle to higher elevations, up to about 11,000 ft., throughout Wyoming except for the northeastern part. Greenland to Alaska, and southward to New Jersey, West Virginia, North Carolina, Illinois, North Dakota, New Mexico, and California; arctic and temperate regions of the Old World.

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4. **Deschampsia elongata** (Hook.) Munro ex Benth. Slender Hairgrass

Mountain meadows, at middle to higher elevations, up to about 10,200 ft., in western Wyoming. Wyoming to Alaska, and southward to Arizona and California; Mexico and Chile.

18. **Trisetum** Pers. *Trisetum*

Perennials with flat blades and usually contracted or spikelike panicles. Spikelets usually 2-flowered (sometimes 3-5-flowered), laterally flattened, the articulation in ours above the glumes and between the florets. Rachilla prolonged behind the upper floret. Glumes slightly unequal in length, the second usually longer than the first floret, acute, the first somewhat narrower than the second. Lemmas keeled, 2-toothed at the apex, the teeth often awned, and bearing a straight or bent and included or exerted awn from the back below the two teeth, or in *T. wolfii* nearly awnless.

**KEY TO THE SPECIES**

Awns, if any, straight and included within the glumes,
2 mm. long or less .................................................. 1. *T. wolfii*
Awns bent and exerted, 4 mm. or more long .................................. 2. *T. spicatum*

1. **Trisetum wolfii** Vasey Wolf's Trisetum

Moist meadows at middle elevations, or sometimes up to 10,000 ft., in the higher mountains of Wyoming. Montana to Washington, and southward to New Mexico and California.

2. **Trisetum spicatum** (L.) Richt. Spike Trisetum

This species is extremely variable in the degree of branching of the inflorescence and in the amount of pubescence of the leaves. Shade forms with a more or less open inflorescence approach *T. montanum* Vasey, a species with a more southern range; and a common, densely pubescent variation has been segregated as *T. spicatum* var. *molle* (Michx.) Beal, probably without much taxonomic significance.

Common in the upper coniferous forest of the mountains and extending above timberline throughout the higher mountains of Wyoming. Arctic America southward to Connecticut, Pennsylvania, northern Michigan, Minnesota, New Mexico, and California; in the high mountains from Mexico to the Antarctic regions of South America; arctic and alpine regions of the Old World.

A tufted perennial, in ours, with narrow blades and slender, erect, shining, spikelike panicles. Spikelets 2-4-flowered, laterally flattened, the articulation above the glumes and between the florets. Rachilla prolonged beyond the perfect florets as a slender bristle or bearing a reduced floret at the tip. Glumes subequal in length, about equaling the first lemma, the first glume somewhat narrower than the second. Lemmas keeled, acute, usually awnless or with a short awn from just below the tip.


Common on prairies and plains, foothills, and lower mountain slopes, usually in rather dry situations, up to about 9,000 ft., and well distributed over Wyoming. Ontario to British Columbia, and southward to Delaware, Missouri, Louisiana, California, and Mexico; temperate regions of the Old World.

20. Avena L.  Oats

Rather tall annuals, with mostly flat blades and open panicles of large spikelets. Spikelets 2-3-flowered, laterally flattened, the articulation above the glumes and between the florets. Rachilla bearded, not prolonged beyond the terminal floret. Glumes subequal in length and width, about 25 mm. long, exceeding the florets, membranaceous or papery and acute. Lemmas convex on the back, indurate below, bidentate at the apex, awnless or with a straight awn from the back, or with a prominent, bent and twisted awn from the middle or below it.

KEY TO THE SPECIES

Florets spreading in the spikelet, usually 3; lemmas with a stout, geniculate, twisted awn .......................... 1. A. fatua

Florets not spreading in the spikelet, usually 2; lemmas with a straight awn or awnless ................................ 2. A. sativa

1. Avena fatua L.  Wild Oat

Occasional as a weed in waste ground or in fields, at lower elevations. Introduced from Europe, and more common on the Pacific Coast, but occasional in other parts of the northern United States.

2. Avena sativa L.  Cultivated Oat

Commonly cultivated and sometimes escaped, mainly in eastern Wyoming. Introduced from Eurasia.
21. Helictotrichon Besser

Tufted perennials, ours with flat or folded blades, the culms 2-4 dm. high, the panicles exserted, narrow, 4-7 cm. long. Spikelets shining, bronze-colored or purplish, 3-several-flowered, about 15 mm. long, the rachilla bearded, not prolonged beyond the terminal floret; the articulation above the glumes and between the florets. Glumes subequal, very thin, longer than the lemmas and a little shorter than the floret group, 3-5-nerved. Lemmas rounded on the back, several-nerved, subhyaline, dorsally awned from near the middle, the awns twisted, geniculate, and exserted, 10-15 mm. long.

1. Helictotrichon hookeri (Scribn.) Henr. Spike Oat

Occasional in coniferous forest and in rocky situations above timberline, up to about 10,500 ft., in northwestern Wyoming. Manitoba and Alberta southward to Minnesota, Montana, and New Mexico.

22. Danthonia Lam & DC. Oatgrass

Tufted, low or moderately tall perennials with curled, flexuous, narrow, flat, folded, or involute leaves and open or contracted panicles or racemes, or sometimes the inflorescence reduced to a single spikelet. Spikelets large, 10-22 mm. long, usually with 2-5 florets, laterally flattened, the articulation above the glumes and between the florets; 1-2-flowered cleistogamous spikelets also produced in the lower sheaths. Rachilla not prolonged beyond the terminal floret. Glumes subequal in length and width, usually exceeding the florets, papery and acute. Lemmas rounded on the back, bidentate at the apex, the teeth acute or often awned, and bearing a flat, twisted, bent awn from between the two teeth.

KEY TO THE SPECIES

Panicles contracted, of several spikelets

- Awns more than 10 mm. long ........................................... 1. D. parryi
- Awns 10 mm. or less long
  - Glumes 11 mm. or less long ........................................... 2. D. spicata
  - Glumes 12 mm. or more long ......................................... 3. D. intermedia

Panicles open, of few spikelets, or reduced to 1 or 2 spikelets

- Spikelets few; awns 7 mm. long or more .............................. 4. D. californica
- Spikelet single (rarely 2); awns 6 mm. or less long .............. 5. D. unispicata
1. *Danthonia parryi* Scribn. Parry Oatgrass

Rather dry, open or brushy hills, at mostly middle elevations, about 8,000-9,000 ft., and seen only from the Laramie Range in southeastern Wyoming. Alberta and Montana southward to New Mexico.

2. *Danthonia spicata* (L.) Beauv. Poverty Oatgrass

Our plants are rather variable, there being two recognizable forms: the typical one with soft and flexuous blades occurs mainly in the eastern part of the state; but in the Yellowstone National Park area there is a stiffer form with straight leaves and more setaceous teeth on the lemmas, found near hot springs and geyser formations. The latter has been called *D. thermale* Scribn.

Wooded areas and about geyser formations, at lower to middle elevations, about 4,000-9,000 ft., mainly in northern Wyoming. Newfoundland to British Columbia, and southward to eastern Kansas, eastern Texas, New Mexico, and Oregon.

3. *Danthonia intermedia* Vasey Timber Oatgrass

Common in dry, often wooded areas, mainly in the mountains, at middle to higher elevations, up to about 11,000 ft., and generally distributed in Wyoming except not seen from the northeastern and southwestern parts. Newfoundland and Quebec to Alaska, and southward to northern Michigan, New Mexico, and California.

4. *Danthonia californica* Boland. California Oatgrass

Meadows and open woods, mostly at middle elevations in the mountains, about 5,000-9,000 ft., and generally distributed in Wyoming except not seen from the northeastern and southwestern parts. Montana to British Columbia, and southward to New Mexico and California; Chile.

5. *Danthonia unispicata* (Thurb.) Munro ex Macoun One-spike Oatgrass

Open or sometimes wooded, rocky or sandy situations, at lower to middle elevations, up to about 9,000 ft., and generally distributed in Wyoming except not seen from the southwestern part. Montana to British Columbia, and southward to Colorado and California.

**Tribe 3. Hordeae** Barley Tribe

Spikelets 1-several-flowered, sessile, on alternate sides of a more or less zig-zag, jointed, channeled rachis which may be continuous or may
disarticulate at maturity, the inflorescence a single, symmetrical, terminal spike. Articulation above the glumes. Glumes often variously modified into bristles or awns, sometimes bifid or trifid. Leaf blades commonly auricled at their junction with the sheath.

KEY TO THE GENERA

1. Spikelets 2-5-flowered, placed flatwise to the rachis and fitting into it; spikes falling entire, the lowest rachis joint appearing like a pointed callus; glumes long-awned; a weedy annual with flat blades ........................................ 27. AEGILOPS

1. Spikelets and other features not as above in all respects

2. Rachis continuous, not breaking up at maturity

3. Spikelets placed flatwise to the rachis or not much flattened; both glumes present

4. Spikelets usually solitary at all joints of the rachis, or if not then the glumes lanceolate or broader; back of the lemmas in the spikelet not visible ........................................ 23. AGROPYRON

2. Rachis disarticulating at maturity

5. Spikelets 3 at each joint of the rachis, the lateral spikelets usually reduced to awns ........................................ 26. HORDEUM

5. Spikelets mostly 1 or 2 at each joint of the rachis, both alike when paired

6. Spikelets single at each joint ........................................ 23. AGROPYRON

6. Spikelets mostly 2 at each joint

7. Awns straight, 1-2 cm. long ........................................ 24. ELYMUS

7. Awns spreading, flexuous, 2-10 cm. long ........................................ 28. SITANION

23. Agropyron Gaertn.  Wheatgrass

Perennials or weedy annuals, with or without creeping rhizomes, the culms usually erect and the spikes erect or sometimes nodding, often bearded. Spikelets 3-several-flowered, single or rarely in pairs at each joint of the rachis, alternate, sessile, and placed flatwise to the continuous rachis, the articulation above the glumes and between the florets. Glumes 2, mostly lanceolate, usually shorter than the first lemma, acute to aristate or long-awned, 5-7-nerved. Lemmas firm, several-nerved, acute or awned, glabrous or pubescent. Palea usually shorter than the lemma.
KEY TO THE SPECIES

1. Spike tapering from base to apex, strongly flattened, 1-10 cm. long; spikelets widely divergent to horizontal at maturity; introduced species

2. Plants perennial; spikes mostly 4-10 cm. long

3. Spikelets divaricate; glumes and lemmas gradually tapering into an awn
   2-5 mm. long
   1. *A. cristatum*

3. Spikelets ascending; glumes and lemmas abruptly narrowed into an awn
   2-3 mm. long

4. Rachis pubescent; awns 2-3 mm. long
   2. *A. desertorum*

4. Rachis glabrous; awns 1-2 mm. long or the lemmas merely mucronate
   3. *A. sibiricum*

2. Plants annual; spikes 1-3 cm. long

1. Spike not tapering, cylindric or flattened, mostly more than 6 cm. long; spikelets erect or ascending, rarely divergent; native species except nos. 12, 15, and 18.

5. Awns, at least some of them, longer than the body of the lemma, mostly more than 10 mm. long

6. Rachis disarticulating when mature

7. Culms erect, 3-8 dm. high
   5. *A. saxicola*

7. Culms decumbent-spreading, 2-4 dm. high
   6. *A. scribneri*

6. Rachis not disarticulating when mature

8. Awns strongly divergent when dry; spike not secund

9. Plants rhizomatous

10. Lemmas pubescent
    7. *A. albicans*

10. Lemmas glabrous
    8. *A. griffithsii*

9. Plants not rhizomatous

11. Spikelets distant on the rachis, overlapping little if any; awns mostly bent at right angles; plants of middle elevations, to about 8,500 ft.
    9. *A. spicatum*

11. Spikelets strongly imbricated; awns divergently curled but seldom bent at right angles; plants of mostly higher elevations, up to about 11,000 ft.
   10. *A. bakeri*

8. Awns straight or nearly so; spike often secund
   11. *A. subsecundum*

5. Awns shorter than the body of the lemma, less than 10 mm. long, or the lemmas awnless

12. Plants rhizomatous

13. Spikelets pubescent or hirsute

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14. Lemmas hirsute with long, white hairs, somewhat obtuse 12. *A. trichophorum*

14. Lemmas short-pubescent, acute

15. Glumes rigid, gradually attenuate 13. *A. smithii*

15. Glumes not rigid, acute or abruptly awn-pointed 14. *A. dasystachyum*

13. Spikelets glabrous

16. Glumes oblong, obliquely truncate, obtuse 15. *A. intermedium*

16. Glumes lanceolate, sharply acute

17. Blades 5-10 mm. wide, flat 16. *A. repens*

17. Blades narrower, involute

18. Glumes 8-12 mm. long 13. *A. smithii*

18. Glumes 5-6 mm. long 17. *A. riparium*

12. Plants not rhizomatous

19. Lower internodes of rachis 15-30 mm. long, much longer than those above 18. *A. elongatum*

19. Lower internodes of rachis shorter, about equaling those above

20. Glumes with a broad, hyaline margin; lemmas pubescent; low alpine plants 2-5 dm. high 19. *A. latiglume*

20. Glumes with narrow or no hyaline margin; lemmas glabrous; plants taller

21. Glumes about equaling the whole spikelets in length 20. *A. trachycaulum*

21. Glumes about half as long as the whole spikelets 21. *A. inerme*

1. *Agropyron cristatum* (L.) Gaertn. Crested Wheatgrass This and the next two species are introductions from Russia, often planted for forage or to stabilize disturbed areas, such as roadsides. They have been treated by tradition as separate species, although they lack good, distinctive characters and appear to be more of a species complex or a single variable species.

Occasionally found as an introduction in rather dry areas at mostly lower elevations, and not as commonly planted as the next species.

2. *Agropyron desertorum* (Fisch.) Schult. Desert Wheatgrass Commonly planted for forage or to hold the soil in rather dry areas, at lower to middle elevations. Introduced from Russia into many parts of the United States and Canada.
3. **Agropyron sibiricum** (Willd.) Beauv.
Occasionally introduced on dry ranges and foothills. Native of Russia.

4. **Agropyron triticum** Gaertn.
An introduced weed in waste land or fields, and apparently rare in Wyoming, our record being from Fremont County. Native of southern Russia.

5. **Agropyron saxicola** (Scribn. & Smith) Piper
There is some evidence that this species is of hybrid origin, perhaps representing an intergeneric cross with *Sitanion*.
Dry slopes at middle elevations, our collections from Yellowstone National Park. South Dakota to Washington, and southward to Utah, Arizona, and California.

6. **Agropyron scribneri** Vasey . Spreading Wheatgrass
Alpine, rocky slopes and meadows at mostly higher elevations, about 9,500-11,000 ft., in the higher mountains of Wyoming. Montana and Idaho southward to New Mexico and California.

7. **Agropyron albicans** Scribn. & Smith
Dry slopes at middle elevations, about 4,000-8,000 ft., in central and northern Wyoming. South Dakota to Alberta, and southward to Idaho, Colorado, and Utah.

8. **Agropyron griffithsii** Scribn. & Smith ex Piper
The type of this species came from the north fork of Clear Creek, Johnson County, and paratypes came from Crook County.
Prairies and hills, in dry situations, at lower to middle elevations, about 3,500-8,000 ft., and occasional in Wyoming mainly east of the Continental Divide. North Dakota to Washington, and southward to South Dakota, Colorado, and Idaho.

9. **Agropyron spicatum** (Pursh) Scribn. & Smith Bluebunch Wheatgrass
Dry hills and plains, often on cut banks, mainly at middle elevations, about 4,000-9,000 ft., and well distributed over Wyoming. Northern Michigan to Alaska, and southward to western South Dakota, New Mexico, Arizona, and California.
Baker Wheatgrass

Apparently rare in Wyoming, on open slopes at higher elevations. Northern Michigan and Alberta to Washington, and southward to Oregon, Idaho, and New Mexico.

11. *Agropyron subsecundum* (Link) Hitchc.  
Bearded Wheatgrass

Two varieties may be recognized in Wyoming: var. *subsecundum*, having culms more than 5 dm. high, spikes 6-15 cm. long, and awns 10-30 mm. long; and var. *andinum* (Scribn. & Smith) Hitchc., having shorter, often geniculate culms, shorter spikes, awns mostly 5-10 mm. long, and the plants more alpine.

Usually in gravelly or rocky soils at middle and higher elevations, about 5,000-11,000 ft., and generally distributed in Wyoming. Newfoundland to Alaska, and southward to Maryland, New Mexico, and California; var. *andinum* from Montana to Washington, and southward to Colorado and Nevada.

12. *Agropyron trichophorum* (Link) Richt.  
Stiff-hair Wheatgrass

Experimentally introduced from Eurasia, but apparently not as successful in Wyoming as *A. intermedium* or *A. elongatum*.

Western Wheatgrass

Two varieties occur in Wyoming: var. *smithii*, having lemmas glabrous; and var. *molle* (Scribn. & Smith) Jones, having lemmas pubescent. These are about equally common in our area, and they have about the same general range. See the following species for distinctions.

Plains and foothills, usually in dry soils, at lower to middle elevations, about 4,000-8,500 ft., and generally distributed in Wyoming. Ontario to Alberta and British Columbia, and southward to Tennessee, Texas, Arizona, and northern California.

Thickspike Wheatgrass

This species is variable in the amount and length of pubescence on the lemmas, and it tends to intergrade with *A. smithii* var. *molle*, from which it may be distinguished by having less rigid glumes that are broadest near the middle, while *A. smithii* var. *molle* has rigid glumes that are broadest at or near the base and taper from base to apex.

Dry, usually sandy soils, often on sand dunes, at lower to middle elevations, about 4,000-8,000 ft., and generally distributed in Wyoming except perhaps in the northeastern part. Michigan to British
Columbia, and southward to Illinois, Nebraska, Colorado, Nevada, and northern California.

15. *Agropyron intermedium* (Host) Beauv. Intermediate Wheatgrass

This species has been introduced experimentally in Wyoming and elsewhere, in meadows and other areas, and it seems to be quite well adapted to our conditions. Europe.

16. *Agropyron repens* (L.) Beauv. Quackgrass

A weed in waste places, fields, and meadows, at lower to middle elevations, and apparently infrequent in Wyoming. Eurasia.

17. *Agropyron riparium* Scribn. & Smith Streambank Wheatgrass

Rather dry, open hills and foothills, at lower to middle elevations, about 4,000-8,500 ft., and occasional throughout most of Wyoming. North Dakota to Alberta and Washington, and southward to Colorado, Utah, Nevada, and Oregon; also a single collection from California.

18. *Agropyron elongatum* (Host) Beauv. Tall Wheatgrass

Sparingly introduced experimentally as a meadow and pasture grass, especially in alkaline areas. Eurasia.


Meadows and tundra at higher elevations, above timberline, about 10,000-11,000 ft., and seen from the Wind River Range and the Beartooth Plateau. Greenland to Alaska, and southward to Colorado; perhaps circumbooreal, depending on the drawing of specific limits.

20. *Agropyron trachycaulum* (Link) Malte Slender Wheatgrass

This is an extremely variable species. The spikelets may be rather well spaced on the rachis or more crowded, and sometimes the spikes show a little tendency to be secund, as in *A. subsecundum*, but the glumes and lemmas are awnless or nearly so. Lower, alpine plants of this species resemble *A. subsecundum* var. *andinum*, often having dense, purplish spikes.

Plains, valleys, and mountains, at mostly middle and higher elevations, about 5,000-10,000 ft., and common throughout most of Wyoming, Labrador to Alaska, and southward to West Virginia, Missouri, New Mexico, northwestern Mexico, and California.

Plains and hills, occasionally in wooded areas, at mostly middle elevations, about 5,000-8,500 ft., and occasional across the southern half of Wyoming, but perhaps also in the northern part. Montana to British Columbia, and southward to western Nebraska, Texas, Colorado, Utah, Nevada, and Oregon.


Perennial, in ours, and often rather tall, coarse grasses, with flat or sometimes convolute blades and rather dense, often bristly spikes. Spikelets 2-6-flowered, usually in pairs (sometimes 3 or more and sometimes solitary) at each joint of the continuous or sometimes disarticulating rachis, placed flatwise to the rachis, but the rachilla twisted at the base so as to bring the front or back of the lemmas against the rachis, the articulation above the glumes and between the florets. Glumes equal, rather rigid, narrowly lanceolate to subulate, sharp-pointed to aristate. Lemmas rounded on the back, faintly 5-nerved, sharp-pointed or usually awned from the tip.

**KEY TO THE SPECIES**

1. Awns of lemmas mostly less than 5 mm. long, or the lemmas awnless

2. Spikes densely villous-pubescent ........................................ 1. *E. innovatus*

2. Spikes not villous

3. Plants with slender, creeping rhizomes ................................. 2. *E. triticoide*

3. Plants without rhizomes, or the rhizomes short and stout

4. Spikelets about 7-8 mm. long; leaves nearly all in a large, dense, basal tuft, their sheaths conspicuously fibrillose in age; introduced .................................................. 3. *E. junceus*

4. Spikelets mostly 10 mm. or more long; leaves not essentially basal, their sheaths not conspicuously fibrillose in age; native

5. Lemmas with awns 2-5 mm. long ........................................ 4. *E. ambiguus*

5. Lemmas awnless or merely mucronate

6. Plants 3-8 dm. high; spikes 5-12 cm. long; blades 1-3 mm. wide .......... 5. *E. salinus*

6. Plants 10-30 dm. high; spikes 15-30 cm. long; blades 5-20 mm. wide .... 6. *E. cinereus*

1. Awns of lemmas mostly more than 5 mm. long
7. Plants with creeping rhizomes
   8. Lemmas glabrous .................................................. 7. E. simplex
   8. Lemmas pubescent .................................................. 8. E. hirtiflorus

7. Plants without rhizomes
   9. Rachis not disarticulating
   10. Glumes subulate, not broadened above the base
       11. Awns straight ................................................. 10. E. villosus
       11. Awns flexuous-divergent .................................. 11. E. interruptus

   10. Glumes narrowly lanceolate, broadened above the base
   12. Glumes thin and flat, not indurate at the base............ 12. E. glaucus
   12. Glumes stiff, rounded and indurate at the base
       13. Awns straight at maturity ................................ 13. E. virginicus

1. Elymus innovatus Beal
   This species has been reported as occurring in Wyoming but no
collections have been seen. It is to be expected in open woods in
the northeastern corner of the state, since it is known to occur in
the Black Hills. Alaska to British Columbia, Montana, probably
northeastern Wyoming, and the Black Hills of South Dakota.

2. Elymus triticoides Buckl.  Beardless Wild-rye
   Two subspecies have been recognized among Wyoming plants: ssp.
triticoides, a tetraploid or hexaploid with culms 2-3.5 mm. in diam-
eter, blades 3-6 mm. broad, and spikelets 8-15 mm. long and with
3-6 florets, and mostly 1-2 spikelets at a node; and ssp. multiflorus
Gould, a large hexaploid with culms 3.5-5 mm. in diameter, blades
6-15 mm. broad, and spikelets 17-25 mm. long, with 6-9 florets, and
some of the nodes with 3-6 spikelets. The former is more common in
Wyoming, and the two subspecies intergrade.
   Dry, alkaline soils at mostly lower elevations, about 5,500-7,500 ft.,
and occasional, mostly in southern Wyoming. Montana to Wash-
ton, and southward to western Texas and Baja California; ssp.
multiflorus from Wyoming to Washington, Nevada, and California.

3. Elymus junceus Fisch.  Russian Wild-rye
   Recently introduced experimentally in semiarid areas, and quite well
adapted to our area at lower to middle elevations. Eurasia.

Wyoming collections are all referred to var. *strigosus* (Rydb.) Hitchc., a paratype being *A. Nelson 7151* from Sweetwater County. This differs from the typical var. *ambiguus* in having lemmas strigose or pubescent instead of glabrous or scabrous.

Occasional on dry plains and hills between 5,000 and 7,500 ft. in southern Wyoming. Montana to Colorado and Utah; the var. *strigosus* in Wyoming and Colorado.

5. *Elymus salinus* Jones  
*Salina Wild-rye*

Dry, clayey soils in desert areas at 5,000-8,500 ft., mainly in Sweetwater County, but perhaps to be found elsewhere in southern Wyoming. Wyoming and Colorado westward to Idaho, Nevada, and southern California.

*Giant Wild-rye*

Until recently this species has been confused with *E. condensatus* Presl, a coastal species of California. Some Wyoming material is intermediate.

Usually in rather dry places on plains and foothills, often along temporary or permanent streams, at about 5,000-8,500 ft., and very common throughout most of Wyoming, although not seen from the northeastern corner. Minnesota to British Columbia, and southward to Colorado and California.

7. *Elymus simplex* Scribn. & Williams

Sometimes treated as a variety of *E. triticoides*, this species seems amply distinct in having awns 3 mm. or more long, in being more robust, and in being largely limited to drifting sand dunes. The type is *Williams 2334*, from Sweetwater County.

Dry, loose, often drifting sands, in desert areas, at 6,000-7,000 ft., in southwestern Wyoming. Wyoming, Colorado, and Utah.


The type of this species is *Shear 284*, from Green River, Sweetwater County, Wyoming, on river banks. It is known only from this locality in Wyoming and from Alberta.

9. *Elymus macounii* Vasey  
*Macoun Wild-rye*

Dry plains and foothills at about 5,000-8,000 ft., and fairly common throughout most of Wyoming, but not seen from the northeastern part. Minnesota to Alaska and eastern Washington, and southward to Iowa, Kansas, New Mexico, and California.
10. Elymus villosus Muhl.

The typical phase of the species includes plants with drooping spikes and more or less hirsute lemmas and glumes. Relatively rare plants, having more erect spikes and scabrous lemmas and glumes, have been designated as forma *arkansana* (Scribn. & Ball) Fernald.

Ravines and canyons, often in shaded situations, in the Black Hills of northeastern Wyoming, at about 3,700-4,500 ft. Southeastern Canada and Vermont to North Dakota and northeastern Wyoming, and southward to South Carolina, Alabama, and Texas.

11. Elymus interruptus Buckl.

No Wyoming collections of this species have been seen, but it is reported for the state in the Manual of the Grasses of the United States by Hitchcock and Chase, 1950. Its distributional pattern suggests its occurrence in the Black Hills area of northeastern Wyoming, in moist, rich, open soils. Michigan to North Dakota and perhaps Wyoming: Tennessee, Arkansas, Oklahoma, Texas, and New Mexico.

12. Elymus glaucus Buckl. Blue Wild-rye

Common in open woods, often with aspen, at middle elevations, about 6,000-9,000 ft., especially in southeastern and northwestern Wyoming. Ontario and Michigan to southern Alaska, and southward to Missouri, Arkansas, New Mexico, and California.

13. Elymus virginicus L. Virginia Wild-rye

Meadows, stream banks, and along ditches, at mostly lower elevations, and apparently infrequent in the eastern half of the state. Newfoundland to Alberta, and southward to Florida and Arizona.

14. Elymus canadensis L. Canada Wild-rye

Some Wyoming collections having stouter, denser, and more erect spikes than the typical phase may be var. *robustus* (Scribn. & Smith) Mack. & Bush.

Rather common in meadows and along ditches, at about 3,500-7,500 ft., throughout Wyoming except perhaps in the southwestern part. Quebec to southern Alaska, and southward to North Carolina, Missouri, Texas, Arizona, and northern California.
25. Lolium L.  Ryegrass

Annuals or perennials with flat blades and flat or somewhat cylindrical, symmetrical spikes, the rachis not disarticulating at maturity. Spikelets single at each node of the rachis, placed edgewise to the rachis, several-flowered, the first glume (adjacent to the rachis) lacking except in the terminal or uppermost spikelets. Articulation above the glumes and between the florets. Introduced weeds or sometimes sown in grass mixtures.

KEY TO THE SPECIES

Glumes shorter than the whole spikelet; perennials

- Lemmas awnless or nearly so ........................................ 1. L. perenne
- Lemmas with awns 4-10 mm. long .................................. 2. L. multiflorum

Glumes equaling or exceeding the whole spikelet; annuals

- Florets plump; lemmas 6-8 mm. long .......................... 3. L. temulentum
- Florets somewhat flattened; lemmas 9-10 mm. long .......... 4. L. persicum

1. Lolium perenne L.  Perennial Ryegrass

An occasional, introduced weed in cultivated and waste ground, at mostly lower elevations. Widely distributed in North America. Europe.

2. Lolium multiflorum Lam.  Italian Ryegrass

Not known to occur in Wyoming, but to be expected as an introduced weed in cultivated and waste ground at lower elevations. Widely introduced in North America, especially on the Pacific Coast. Europe.

3. Lolium temulentum L.  Darnel

Not known to occur in Wyoming, but to be expected as a weed in cultivated and waste ground at lower elevations. Widely introduced in North America. Europe.

4. Lolium persicum Boiss. & Hohen.

An occasional weed in grain fields and waste ground, at lower elevations, in northeastern Wyoming. Introduced from Ontario to Alberta, North Dakota, and Wyoming. Russia and northern Iran.

26. Hordeum L.  Barley

Annuals or perennials with flat blades and bristly, symmetrical spikes which break up at maturity (except in H. vulgare L., cultivated
Barley). Spikelets mostly 1-flowered, usually 3 together at a node of the rachis, the central spikelet of each group usually sessile and fertile, the lateral spikelets of the group short-pedicelled and usually sterile. Glumes very narrow and usually awned. Fertile lemma rounded on the back, 5-nerved, and tapering into a slender awn. Articulation above the glumes and in the rachis.

**KEY TO THE SPECIES**

Plants perennial; auricles at base of blade lacking

- Awns 2-5 cm. long; spike, including the awns, about as broad as long .................................................. 1 *H. jubatum*
- Awns about 1 cm. long; spike, including the awns, much longer than wide .................................................. 2 *H. brachyantherum*

Plants annual; auricles at base of blade present or lacking

- Base of blade with prominent auricles; awns mostly 2-4 cm. long .................................................. 3 *H. leporinum*
- Base of blade without auricles; awns mostly less than 1 cm. long .................................................. 4 *H. pusillum*

1. *Hordeum jubatum* L. Foxtail Barley

Occasional plants having shorter awns 15-30 mm. long, and occurring with typical plants, have been designated as var. *caespitosum* (Scribn.) Hitchc.

Very common on plains and foothills, roadsides, ditches, and waste ground, throughout most of Wyoming, at lower to middle elevations, about 3,500-9,000 ft. Newfoundland to Alaska, and southward to Maryland, Missouri, Texas, California, and Mexico.

2. *Hordeum brachyantherum* Nevski Meadow Barley

Moist meadows, ditches, and bottom land, mostly at middle elevations, about 4,000-8,000 ft., and generally distributed in Wyoming, Alaska southward to California, and in Labrador and Newfoundland; Montana southward to New Mexico and Arizona; introduced in some eastern states.

3. *Hordeum leporinum* Link

Our single record is from Hot Springs Park, Hot Springs County, where the species is a weed. Introduced in scattered localities in the United States. Southern Europe.

4. *Hordeum pusillum* Nutt. Little Barley

Plains and meadows, often in alkaline situations, at lower to middle elevations, about 3,500-8,000 ft., and occasional, collections having
been seen from southeastern and northwestern Wyoming. Delaware to Washington, and southward to Florida, southern California, and northern Mexico; introduced in Maine and Pennsylvania.

27. Aegilops L. 

Goatgrass

Introduced, weedy annual with flat blades and symmetrical, cylindrical spikes, the spikelets 2-5-flowered, placed flatwise to the rachis, and single at each joint of the rachis, fitting into it, the whole spike commonly falling entire or sometimes disarticulating between the spikelets. Glumes, in ours, with long, single awns.

1. Aegilops cylindrica Host 

Jointed Goatgrass

A weed in fields and waste places, occasional at lower elevations in northeastern Wyoming. Widely introduced in the United States and Europe.

28. Sitanion Raf. 

Squirreltail

Perennials with very bristly, crowded spikes, the rachis breaking up at maturity. Spikelets usually 2 at each node of the rachis, 2-several-flowered, the glumes rigid and subulate, with 1 or more long awns, the lemmas terete, long-awned, and 5-nerved. Articulation above the glumes, or the spikelets falling with a joint of the rachis.

Intergeneric hybrids with Elymus occur in Wyoming occasionally, and in other areas hybrids with Agropyron have been reported.

The following treatment is adapted from that of F. D. Wilson in Brittonia 15:303-323, 1963.

KEY TO THE SPECIES

Basal floret of one or both spikelets at each node sterile and reduced to a subulate or lanceolate body resembling a glume segment ............... 1. S. hystrix

Basal floret fertile, not reduced

Awns of glumes longer than awns of lemmas; glumes subulate, entire .............. 2. S. longifolium

Awns of glumes shorter than awns of lemmas; glumes usually lanceolate, entire or 2-several-cleft .............. 3. X S. hansenii

1. Sitanion hystrix (Nutt.) J. G. Smith

Two varieties have been recognized: var. hystrix, in which one or more of the glumes at each node are 2-cleft, and the awns of the
glumes are longer than the awns of the lemmas; and var. *californicum* (J. G. Smith) F. D. Wilson, in which the glumes are entire, and the awns of the glumes are shorter than the awns of the lemmas. Of these, var. *hystrix* is commoner and more widespread in Wyoming, occurring on plains and foothills, whereas var. *californicum* is found mainly in northwestern Wyoming at middle and higher elevations. Badlands of southwestern South Dakota to southern British Columbia, and southward to Colorado, Utah, and California, the var. *californicum* in the higher mountains of this range.

2. *Sitanion longifolium* J. G. Smith

Highly variable in habitat and size over its wide range. Generally distributed in Wyoming at lower to middle elevations, up to about 8,000 ft., on plains, foothills, and mountain valleys. Missouri, Kansas, Nebraska, and South Dakota to Washington, and southward to western Texas, Hidalgo, Arizona, and California.

3. *X Sitanion hansenii* (Scribn.) J. G. Smith

An apparent hybrid with *Elymus glaucus* as one parent and probably *Sitanion hystrix* var. *californicum*, occurring occasionally in northwestern Wyoming. The plants are generally more or less intermediate in characters between the parental types. This hybrid has been reported from Wyoming to Colorado westward to Washington and California.

Tribe 4. Agrostideae  Timothy Tribe

Spikelets 1-flowered (sometimes 2-flowered in *Muhlenbergia asperifolia*), the lemmas awnless, awned from the tip, or awned from the back. Glumes usually well developed (except in *Phippsia*, in which the glumes are minute and the first glume is often lacking). Articulation usually above the glumes (below the glumes in *Cinna*, *Allopecurus*, and *Polypogon*). Inflorescence an open, narrow, or spikelike panicle or sometimes a spikelike raceme.

**KEY TO THE GENERA**

1. Articulation above the glumes

2. Lemma terete or compressed, not indurate (hardened), usually with 1 or more evident nerves, awned or awnless

3. Glumes not keeled, seldom awned, sometimes minute

4. Callus of lemma with a tuft of hairs at least half as long as the lemma

5. Lemmas dorsally awned .................................. 29. *CALAMAGROSTIS*
5. Lemmas awnless ........................................... 30. CALAMOVILFA
4. Callus of lemma without a tuft of hairs
6. Glumes longer than the lemmas .......................... 31. AGROSTIS
6. Glumes equaling or shorter than the lemmas
7. Lemmas 3-nerved or sometimes 5-nerved; grain (caryopsis) cylindrical or somewhat dorsally flattened, usually not falling from the floret
8. Glumes minute, the first often lacking; low alpine plants less than 1 dm. tall, with blades boat-shaped at the tips; lemmas awnless, abruptly acute .......................... 36. PHIPPSIA
8. Glumes well developed; plants of low to middle elevations, more than 1 dm. tall, with blades not boat-shaped at the tips; lemmas awned or at least mucronate .......................... 37. MUHLENBERGIA
7. Lemmas 1-nerved; grain (caryopsis) obovate, usually strongly laterally flattened, readily dropping from the floret .......................... 38. SPOROBOLUS
3. Glumes compressed-keeled and awned, not minute .......................... 35. PHLEUM
2. Lemma terete, indurate (hardened), and persistent around the mature fruit, without evident nerves, terminally awned, the awn single or 3-forked, sometimes deciduous
9. Awn readily deciduous; callus blunt .......................... 39. ORYZOPSIS
9. Awn persistent; callus sharp-pointed
10. Awn simple .................................................. 40. STIPA
10. Awn 3-forked .................................................. 41. ARISTIDA
1. Articulation below the glumes
11. Glumes awnless; panicle open or spikelike
12. Panicle open .................................................. 32. CINNA
12. Panicle spikelike, cylindrical ................................ 33. ALOPECURUS
11. Glumes long-awned; panicle spikelike .......................... 34. POLYPOGON

29. Calamagrostis Adans. Reedgrass

Perennials, often with creeping rhizomes, with flat or involute blades and small spikelets in open or contracted panicles. Spikelets 1-flowered, the articulation above the glumes, the rachills in ours prolonged behind the palea as a short, often hairy bristle. Glumes nearly equal, acute, longer than the lemma. Lemma awned from the back and bearing a tuft of hairs from the callus, the awn exserted and straight or geniculate or included.
### KEY TO THE SPECIES

1. Awn longer than the glumes, geniculate; glumes 6-8 mm. long ................................................................. 1. *C. purpurascens*

1. Awn shorter than the glumes, straight or geniculate; glumes mostly shorter

2. Awn geniculate

3. Blades narrow, 0.5-2 mm. wide, involute; culms 15-40 cm. high ................................................................. 2. *C. montanensis*

3. Blades mostly broader, flat; culms taller

4. Collar of sheaths pubescent ............................................. 3. *C. rubescens*

4 Collar of sheaths glabrous ............................................. 4. *C. koelerioides*

2. Awn straight

5. Collar of sheaths pubescent ............................................. 5. *C. scribneri*

5. Collar of sheaths glabrous

6. Panicle open; callus hairs nearly as long as the lemma 6. *C. canadensis*

6. Panicle contracted or spikelike; callus hairs about three-fourths as long as the lemma or shorter

7. Blades flat and lax, 3-7 mm. wide ...................................... 7. *C. scopulorum*

7. Blades involute and rigid, or else soft, flat, and very narrow

8. Ligule 4-7 mm. long; blades rather rigid ......................... 8. *C. inexpansa*

8. Ligule 2-3 mm long; blades soft and almost filiform ......................... 9. *C. neglecta*

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1. Calamagrostis purpurascens R. Br.  Purple Reedgrass

Occasional in mountainous areas of Wyoming at about 6,000-10,000 ft. Greenland to Alaska, and southward to Quebec, the Black Hills of South Dakota, Colorado, and California.

2. Calamagrostis montanensis Scribn.  Plains Reedgrass

Dry, often sandy soil, on plains and foothills, up to about 8,500 ft., and scattered over most of Wyoming. Manitoba to Alberta, and southward to South Dakota, Wyoming, and Idaho.

3. Calamagrostis rubescens Buckl.  Pinegrass

Usually in wooded, mountainous areas at middle elevations, about 6,000-9,000 ft., and seen from southeastern and northwestern Wyoming, but perhaps to be found elsewhere. Manitoba to British Columbia, and southward to northern Colorado and central California.
4. **Calamagrostis koelerioides** Vasey

Apparently rare in northwestern Wyoming at middle elevations. Two collections, both in the U. S. National Herbarium and verified by J. R. Swallen are *Merrill 77*, from Teton Pass, Teton County, and *Merrill & Wilcox 373*, from Spread Creek, Grand Teton National Park. Northwestern Wyoming and Washington southward to southern California.

5. **Calamagrostis scribneri** Beal  
**Scribner Reedgrass**

Moist meadows at middle elevations, and known for Wyoming only from northeastern Yellowstone National Park, Slough Creek, *Tweedy 585*, in the U. S. National Herbarium. Montana and adjacent Wyoming to Washington, and southward to California.

6. **Calamagrostis canadensis** (Michx.) Beauv.  
**Bluejoint**

Moist places in the mountains and foothills at mostly middle elevations, about 6,000-10,000 ft., and common in Wyoming. Greenland to Alaska, and southward to Maryland, North Carolina, Missouri, Kansas, Colorado, Arizona, and California.

Plants with smaller spikelets about 2 mm. long have been designated as var. *macouniana* (Vasey) Stebbins, an insignificant variant that has been reported from Yellowstone National Park, as well as from several scattered localities within the range of the species.

7. **Calamagrostis scopulorum** Jones

Moist, rocky ravines and slopes at middle elevations, and known for Wyoming from a single collection, *Murie 373*, from Wild Cat Peak, Teton County, and in the U. S. National Herbarium. Wyoming, Colorado, and Utah.

8. **Calamagrostis expansa** A. Gray  
**Northern Reedgrass**

Usually in moist places on plains and foothills, sometimes ascending to 9,000 ft. in the mountains, and fairly common throughout most of Wyoming. Greenland to Alaska, and southward to Maine, New York, Illinois, Missouri, Nebraska, New Mexico, and California.

9. **Calamagrostis neglecta** (Ehrh.) Gaertn.

Moist places on plains and foothills, up to about 8,000 ft., and fairly common throughout the eastern two-thirds of Wyoming. Greenland to Alaska, and southward to Maine, Vermont, New York, Michigan, Wisconsin, Colorado, Utah, and Oregon; northern Eurasia.
30. Calamovilfa Hack.

A tall, coarse perennial with open panicles and stout, creeping rhizomes, in ours found chiefly in sandy areas. Spikelets 1-flowered, the articulation above the glumes, the rachilla prolonged behind the palea. Glumes unequal in length, chartaceous, 1-nerved. Lemma about equaling the second glume, like it in texture, and 1-nerved, awnless, with a long-bearded callus. Palea about equaling the lemma.

1. Calamovilfa longifolia (Hook.) Scribn.

Dry, sandy plains and hills, at lower to middle elevations, about 4,000-8,000 ft., and frequent throughout most of Wyoming, especially in sand dune areas. Michigan to Alberta, and southward to Indiana, Colorado, and Idaho.

31. Agrostis L. Bentgrass

Perennials or rarely annuals with mostly flat blades and open or narrow panicles. Spikelets 1-flowered, the articulation above the glumes, the rachilla sometimes prolonged behind the palea as a slender bristle. Glumes nearly equal, acuminate to awn-pointed, usually scabrous on the keel or on the back or both. Lemmas awnless or dorsally awned, the awn, when present, included or exerted. Palea evident and 2-nerved or reduced to a minute, nerveless scale.

KEY TO THE SPECIES

1. Palea evident and 2-nerved

2. Rachilla prolonged behind the palea ........................................ 1. A. thurberiana

2. Rachilla not prolonged

3. Culms 30-90 cm. high; plants rhizomatous, rarely found at high elevations .................................................. 2. A. alba

3. Culms up to 15 cm. high; plants not rhizomatous, found in alpine situations ........................................... 3. A. humilis

1. Palea obsolete or only a minute, nerveless scale

4. Panicle contracted

5. Culms 25-95 cm. high; blades 2-8 mm. wide ......................... 4. A. exarata

5. Culms 8-15 cm. high; blades 0.75-2 mm. wide

6. Plants annual; blades 1.5-2 mm. wide, scabrous, firm, flat; panicle branches scabrous; confined to hot spring areas in Yellowstone National Park ......................... 5. A. rossae

6. Plants perennial and tufted; blades not more than 1 mm. wide, smooth, lax, usually involute; panicle branches glabrous; widespread in alpine areas ............................. 6. A. variabilis
4. Panicle open or diffuse

7. Panicle diffuse, with capillary branches that rebranch above the middle ................................. 7. A. scabra

7. Panicle open but not diffuse, with stiffer branches that rebranch at or below the middle

8. Lemmas awnless

9. Spikelets 1.5-2 mm. long; plants 10-25 cm. high; alpine ............................................. 8. A. idahoensis

9. Spikelets 2.5-3 mm. long; plants 60-90 cm. high; middle elevations ................................... 9. A. oregonensis

8. Lemmas with a short, straight awn ......................................... 10. A. borealis

1. Agrostis thurberiana Hitchc.
Moist places, usually in bogs, at higher elevations, about 9,000-11,000 ft., and scattered throughout the higher mountains of Wyoming, British Columbia to Colorado, and in the Sierras to central California.

2. Agrostis alba L. Redtop
Meadows or moist situations at lower to middle elevations, and sometimes cultivated as a pasture grass. Common throughout most of Wyoming and the cooler parts of the United States. Native of Eurasia.

3. Agrostis humilis Vasey
Occasional in moist, alpine situations at about 9,500-10,500 ft. Wyoming and Colorado to Washington and Oregon.

In mesophytic habitats on plains and hills, at lower to middle elevations, and scattered over most of Wyoming. Alberta to Alaska, and southward to western Nebraska, New Mexico, Mexico, and California.

5. Agrostis rossae Vasey
The species is known only from hot spring areas in Yellowstone National Park, the type having been collected by Miss Edith A. Ross. For a detailed discussion of this species and its relation to A. variabilis, with which it has been confused, see the statement by J. R. Swallen in Leafl. West. Bot. 5:123-124, 1948.

6. Agrostis variabilis Rydb.
Moist, alpine situations, and seen from the Medicine Bow Range in Albany County, and from the Sierra Madre in Carbon County. Alberta and Washington southward to Colorado, Utah, and California.

Meadows or other moist situations at lower to middle and higher elevations, and common throughout most of Wyoming. Plants of higher elevations with dark purple spikelets and stiffer, smaller panicles have been designated as var. *geminata* (Trin.) Swallen, and have been seen from Albany, Teton, and Washakie counties. Newfoundland to Alaska, and southward to Florida, California, and Mexico.

8. *Agrostis idahoensis* Nash

Occasional in meadows at middle and higher elevations. Western Montana to Washington, and southward to New Mexico and the higher mountains of California; also Alaska, the Gaspé Peninsula, and the Gulf of St. Lawrence.

9. *Agrostis oregonensis* Vasey

The single Wyoming collection is *Frank Tweedy* 36, from the Gros Ventre River, Teton County, deposited in the U. S. National Herbarium. Marshes, bogs, and wet meadows, at middle elevations. Montana to British Columbia, and southward to Wyoming and California.


A single Wyoming collection has been seen, *A. A. Beetle* 5272, from Medicine Bow Peak, Albany-Carbon county line, at about 11,000 ft. Greenland and Newfoundland to Alaska, and southward in the high mountains to New England, New York, West Virginia, North Carolina, Alberta, Colorado, Utah, and Washington; northern Europe.

32. *Cinna L.* Woodreeed

A tall perennial with flat blades and open panicles, in ours, usually found in moist woods. Spikelets 1-flowered, the articulation below the glumes, the rachilla prolonged behind the palea as a minute bristle. Glumes subequal, 1-nerved or 3-nerved. Lemma similar to the glumes, about equaling them, 3-nerved, and with a minute, sub-terminal awn, or rarely awnless. Palea keeled.

1. *Cinna latifolia* (Trevir.) Griseb.

Moist woods, stream banks, or brushy areas, at lower to middle elevations, and widely scattered over Wyoming. Newfoundland and Labrador to Alaska, and southward to Connecticut, North Carolina, Michigan, Illinois, South Dakota, northern New Mexico, and central California; northern Eurasia.
33. Alopecurus L.  Foxtail

Annuals or perennials with flat blades and soft, compact, spike-like panicles. Culms often decumbent, sometimes rooting at the lower nodes. Spikelets 1-flowered, strongly laterally flattened, the articulation below the glumes. Glumes equal in length, ciliate at least on the keel, about equaling the floret. Lemma obtuse, dorsally awned from below the middle, the awn included or exserted. Palea lacking.

KEY TO THE SPECIES

1. Inflorescence ovoid, 15-30 mm. long ........................................... 1. A. alpinus

1. Inflorescence cylindric, 40 mm. or more long

2. Blades often 5-10 mm. wide; introduced species of fields and meadows

3. Spikelets 4-5 mm. long; glumes sparsely pubescent on the sides, long-ciliate on the keel; culms up to 9 dm. high ........................................... 2. A. arundinaceus

3. Spikelets 5-6 mm. long; glumes pubescent on the sides, villous on the keel; culms mostly shorter 3. A. pratensis

2. Blades mostly less than 5 mm. wide; native or introduced species

4. Awn included or exserted only up to 1.5 mm. beyond the glumes; plants perennial 4. A. aequalis

4. Awn exserted 2-3 mm. beyond the glumes; plants annual or perennial

5. Plants annual and tufted, introduced in moist fields and meadows; anthers about 0.5 mm. long ........................................... 5. A. carolinianus

5. Plants perennial, scarcely tufted, native in ponds, lakes, and streams; anthers about 1.5 mm. long ........................................... 6. A. geniculatus

1. Alopecurus alpinus J. E. Smith  Alpine Foxtail

Mountain meadows and moist stream banks, at middle to higher elevations, about 6,500-10,000 ft., and occasional in Wyoming. Greenland to Alaska, and southward to Colorado; circumboreal.

2. Alopecurus arundinaceus Poir.

Occasionally introduced in hay meadows that are moist and not very alkaline. Eurasia.

3. Alopecurus pratensis L.  Meadow Foxtail

Occasionally introduced in moist meadows at middle elevations in western Wyoming. Newfoundland and Labrador to Alaska, and southward to Delaware, Missouri, Wyoming, Idaho, and Oregon; Eurasia.

4. Alopecurus aequalis Sobol.  Short-awn Foxtail

Common in wet places at lower to higher elevations throughout most of Wyoming, from about 3,500-10,500 ft. Greenland to Alaska, and southward to Pennsylvania, Illinois, Kansas, New Mexico, and California; Eurasia.
5. *Alopecurus carolinianus* Walt.


6. *Alopecurus geniculatus* L.  

Water Foxtail

In water and muddy places, mostly at lower elevations, and seen from Crook, Niobrara, and Sheridan counties. Newfoundland to Saskatchewan and British Columbia, and southward to New York, New Jersey, Michigan, Colorado, Arizona, and California; Eurasia.

34. *Polypogon* Desf.

Annual, in ours, with flat, scabrous blades and bristly, spike-like panicles. Spikelets 1-flowered, laterally flattened, the articulation below the glumes. Glumes equal in length, slightly 2-lobed, long-awned from between the lobes, hispid on the back. Lemma about half as long as the glumes and bearing a short, delicate, terminal awn.


Rabbitfoot Grass

Moist places at lower to middle elevations, about 3,500-8,000 ft., and widely scattered over Wyoming. Widely introduced in the Western Hemisphere from Europe.

35. *Phleum* L.  

Timothy

Perennials, in ours, with flat blades and erect, compact, spike-like panicles or racemes. Spikelets 1-flowered, laterally flattened, the articulation above the glumes. Glumes equal in length, longer than the lemma, sharply keeled and pectinately ciliate on the keel, terminating in a short awn. Lemmas awnless, truncate, and hyaline.

**KEY TO THE SPECIES**

| Inflorescence 6-20 times longer than wide; sheaths not inflated | 1. *P. pratense* |
| Inflorescence usually not more than 4 times longer than wide; sheaths inflated | 2. *P. alpinum* |

1. *Phleum pratense* L.  

Timothy

Commonly escaped and often cultivated in meadows at lower to middle elevations throughout most of Wyoming. Widely introduced in North America from Eurasia.

2. *Phleum alpinum* L.  

Alpine Timothy

Mountain meadows and rocky slopes, at middle to higher elevations, about 8,500-11,000 ft., throughout the higher mountains of Wyo-
ming. Greenland to Alaska, and southward to Maine, New Hampshire, northern Michigan, New Mexico, and California; circumboreal, and in alpine regions of the Southern Hemisphere.

36. Phippsia (Trin.) R. Br.

A dwarf, high-alpine perennial of wet places, with narrow, few-flowered panicles of small spikelets. Spikelets 1-flowered, the articulation above the glumes, the rachilla not prolonged. Glumes unequal, minute, the first sometimes wanting. Lemma thin, somewhat keeled, 3-nerved, abruptly acute. Palea dentate, a little shorter than the lemma.

1. Phippsia algida (Phipps) R. Br.

High alpine near permanent snow in the Beartooth Plateau, Park County. Arctic regions of both hemispheres; also known from Colorado.

37. Muhlenbergia Schreb. Muhly

Annuals, or more commonly perennials in ours, with flat, folded, or involute blades, open or narrow panicles, and with or without creeping rhizomes. Spikelets small, 1-flowered (rarely 2-flowered in M. asperifolia), the articulation above the glumes. Glumes membranaceous, obtuse, acute, acuminate, or mucronate, short- or long-awned, and occasionally bifid, the awn when present terminal or subterminal. Lemma firm-membranaceous, 3-nerved, acute, awned or mucronate. Palea of the same texture as the lemma, usually 2-keeled, the lemma and palea firmly enclosing the fusiform grain.

KEY TO THE SPECIES

1. Plants annual

2. Panicle open, with capillary branches; spikelets 1.2-1.5 mm. long ............................... 1. M. minutissima

2. Panicle very narrow, the branches stiff and short, erect; spikelets mostly 2-3 mm. long ........................................ 2. M. filiformis

1. Plants perennial

3. Rhizomes present, creeping

4. Panicle open

5. Spikelets 4–5 mm. long; blades involute ........................................................ 3. M. pungens

5. Spikelets 1.5–2 mm. long; blades flat ........................................................ 4. M. asperifolia

4. Panicle contracted
6. Hairs at base of lemma conspicuous and as long as the body of the lemma or longer ........................................ 5. M. andina

6. Hairs at base of lemma inconspicuous or not more than half as long as the body of the lemma
7. Blades mostly involute, 2 mm. wide or less; culms 2.5-5 dm. high ........................................ 6. M. richardsonis

7. Blades mostly flat and broader; culms taller
8. Panicle compact and simple or interrupted, bristly; glumes exceeding the lemma
9. Culms mostly simple or branching at the base; internodes minutely puberulent; sheaths not at all or scarcely keeled ........................................ 7. M. glomerata

9. Culms mostly branching from the middle; internodes smooth and glossy except at the summit; sheaths keeled 8. M. racemosa
8. Panicle with distinct, separate branches, not bristly; glumes not exceeding the lemma ........................................ 9. M. mexicana

3. Rhizomes not present, but culms sometimes bulbous at the base
10. Second glume 3-nerved and usually 3-toothed; culms not bulbous at the base

11. Awn of lemma 6-15 mm. long; lemma about 4 mm. long; culms 30-60 cm. high ........................................ 10. M. montana

11. Awn of lemma 2-4 mm. long; lemma 2.5-3 mm. long; culms 10-30 cm. high ........................................ 11. M. filiculmis

10. Second glume 1-nerved, entire; culms bulbous at the base ... 12. M. cuspidata

1. Muhlenbergia minutissima (Steu d.) Swallen

Moist, sandy or rocky soil of stream banks, meadows, and open woods, at lower to middle elevations in southern and southeastern Wyoming. Montana to Washington, and southward to northern Mexico.

2. Muhlenbergia filiformis (Thurb.) Rydb. Pull-up Muhly

Two more or less distinguishable varieties occur in Wyoming: the typical var. filiformis, which is a more delicate plant of somewhat higher elevations, and var. fortis E. H. Kelso (M. simplex Rydb.), a more robust phase with coarser stems and lemmas more than 2 mm. long, found mostly at lower elevations.

Moist places, usually in the mountains at middle and higher elevations, about 6,000-10,000 ft., and widely scattered in Wyoming. South Dakota to British Columbia, and southward to Kansas, New Mexico, and California.
3. **Muhlenbergia pungens** Thurb.

Warm, dry, sandy plains and foothills, at lower to middle elevations, the single Wyoming collection, *C. L. Porter 5281*, having come from Sand Creek, southern Albany County. South Dakota and Nebraska southward and westward to Wyoming, Utah, Colorado, New Mexico, and Arizona.

4. **Muhlenbergia asperifolia** (Nees & Mey.) Parodi  
*Scratchgrass*

Common in alkaline soils of bottomlands and plains, at lower to middle elevations, throughout most of Wyoming except perhaps for the northeastern corner. Illinois and Alberta to British Columbia, and southward to Texas, California, and Mexico; southern South America.

5. **Muhlenbergia andina** (Nutt.) Hitchc.  
*Foxtail Muhly*

Moist stream banks and sandbars, at middle elevations, about 5,000-7,000 ft., mainly in southern and western Wyoming. Montana to eastern Washington, and southward to New Mexico and central California.

6. **Muhlenbergia richardsonis** (Trin.) Rydb.  
*Mat Muhly*

Dry to moderately moist meadows and hills, often associated with anthills, at middle to higher elevations, about 6,000-9,800 ft., and common throughout most of Wyoming except perhaps for the northeastern part. New Brunswick to Alberta, and southward to South Dakota, New Mexico, California, and Mexico.

7. **Muhlenbergia glomerata** (Willd.) Trin.

This and the next species are closely related and often confused. The internodes may be glabrous in *M. glomerata*, but they are minutely roughened, whereas the internodes of *M. racemosa* are glossy and very smooth.

Apparently rare in Wyoming, and seen only from moist situations at lower to middle elevations in Goshen and Sublette counties. Newfoundland to British Columbia, and southward to Maine, Wisconsin, Indiana, Nebraska, and Wyoming.

8. **Muhlenbergia racemosa** (Michx.) B.S.P.  
*Marsh Muhly*

Along streams and in meadows at mostly lower elevations, about 3,500-5,000 ft., and occasional in the eastern, central, and northern parts of Wyoming. Newfoundland to British Columbia, and southward to Maryland, Kentucky, Oklahoma, and Arizona.
9. Muhlenbergia mexicana (L.) Trin. Wire-stem Muhly
Occasional on moist stream banks and in meadows at lower elevations, about 3,500-4,000 ft., in eastern and northern Wyoming, Quebec and Maine to Washington, and southward to North Carolina, Arkansas, New Mexico, and Arizona.

10. Muhlenbergia montana (Nutt.) Hitchc. Mountain Muhly
Dry hills at middle elevations, about 6,000-8,000 ft., and occasional in southeastern Wyoming. Montana to Utah and central California, and southward to western Texas and southern Mexico.

11. Muhlenbergia filiculmis Vasey Slimstem Muhly
Gravelly, often granitic soils of foothills and mountains, up to about 9,000 ft., in eastern Wyoming. Wyoming, Colorado, and New Mexico.

12. Muhlenbergia cuspidata (Torr.) Rydb. Plains Muhly
Sandy or marly soils on plains and foothills at lower elevations, about 4,000-5,500 ft., in eastern Wyoming. Michigan to Alberta, and southward to Ohio and New Mexico.

38. Sporobolus R. Br. Dropseed
Annuals or perennials with flat or involute blades and narrow or open panicles. Spikelets 1-flowered, disarticulating above the 1-nerved and somewhat unequal glumes. Lemma membranaceous, awnless, 1-nerved. Palea equaling or exceeding the lemma and sometimes split by the fruit at maturity. Grain free from the lemma and palea, readily falling from the spikelet at maturity.

KEY TO THE SPECIES

1. Plants annual; panicles partly or entirely enclosed in swollen leaf-sheaths .............................................. 1. S. neglectus

1. Plants perennial; panicles exserted

2. Panicle narrow, 1-5 cm. wide; spikelets 3-5 mm. long .......... 2. S. heterolepis

2. Panicle open, 10 cm. or more wide; spikelets 2-2.5 mm. long

3. Sheaths with a conspicuous tuft of white hairs at their junction with the blades; panicle branches floriferous throughout .......... 3. S. cryptandrus

3. Sheaths without a tuft of hairs at their junction with the blades; panicle branches floriferous only near their extremities .......... 4. S. airoides
1. **Sporobolus neglectus** Nash

   Dry, usually sandy soils of fields and waste ground, becoming weedy in the northern part of the Big Horn Basin. Quebec and Maine to North Dakota and northern Wyoming, and southward to Tennessee and Texas; also Washington and Arizona.

2. **Sporobolus heterolepis** (A. Gray) A. Gray  
   **Prairie Dropseed**

   Dry prairies and hillsides at lower elevations, about 3,500-4,500 ft., in northeastern Wyoming. Quebec to Saskatchewan and northeastern Wyoming, and southward to Connecticut, Illinois, Arkansas, and eastern Texas.

3. **Sporobolus cryptandrus** (Torr.) A. Gray  
   **Sand Dropseed**

   Dry, sandy or moderately alkaline prairies and bottomlands at lower to middle elevations, about 4,000-7,500 ft., and common in Wyoming except for the northeastern and northwestern parts. Maine and Ontario to Alberta and Washington, and southward to North Carolina, Indiana, Louisiana, Arizona, and Mexico.

4. **Sporobolus airoides** (Torr.) Torr.  
   **Alkali Sacaton**

   Alkaline bottomlands and plains at lower to middle elevations, about 3,500-7,500 ft., and common throughout most of Wyoming. South Dakota and Missouri to eastern Washington, and southward to Texas and southern California.

39. **Oryzopsis** Michx.  
   **Ricegrass**

   Slender perennials with flat or involute blades and open or narrow panicles. Spikelets 1-flowered, disarticulating above the glumes. Glumes subequal, obtuse to acuminate. Lemma indurated (hardened), mostly terete and often pubescent, with a short, blunt, oblique callus, and terminated by a short, straight or geniculate, deciduous awn, the lemma enclosing the palea and fruit at maturity.

   Hybrids between *Oryzopsis hymenoides* and species of *Stipa* are known to occur in Wyoming. One of these has been designated as X *Stiporyzopsis caduca* (Beal) Johnson & Rogler, based on *Oryzopsis caduca* Beal, which is a sterile hybrid with *Stipa viridula*. Another hybrid, X *Stiporyzopsis bloomeri* (Boland.) Johnson, and likewise sterile, results from a crossing of *Oryzopsis hymenoides* with *Stipa occidentalis*, and has been reported from Idaho and California. It might be expected in western Wyoming where the ranges of the parent species overlap. For a discussion of these plants see Amer. Jour. Bot. 30:49-56, 1943; and 32:599-608, 1945.
KEY TO THE SPECIES

1. Inflorescence narrow, spikelike or racemose, 2 cm. wide or less

2. Blades flat, about 5 mm. wide; glumes 5-7 mm. long; awns straight or flexuous, 5-10 mm. long ........................................ 1. O. asperifolia

2. Blades usually involute, 1-2 mm. wide; glumes 3-4 mm. long; awns straight or geniculate, 1-5 mm. long

3. Awns 1-2 mm. long, straight or nearly so ................................ 2. O. pungens

3. Awns about 5 mm. long, geniculate .................................... 3. O. exigua

1. Inflorescence an open panicle, at least 5 cm. wide

4. Panicle dichotomously branched, floriferous only at the ends of the branches; glumes abruptly acuminate, 6-8 mm. long; fruit plump and silky-hairy ................................................................. 4. O. hymenoides

4. Panicle not dichotomously branches, the spikelets clustered near the ends of the branches; glumes gradually narrowed above, 3-4 mm. long; fruit slender, glabrous or nearly so ..................................................... 5. O. micrantha

1. Oryzopsis asperifolia Michx.

Rather dry woods at lower to middle elevations, about 3,500-8,500 ft., in northern and southeastern Wyoming. Newfoundland to Montana and British Columbia, and southward to Connecticut, Indiana, South Dakota, and New Mexico.

2. Oryzopsis pungens (Torr.) Hitchc.

Sandy and rocky slopes of dry hills, and seen only from Crook County, Inyankara Mountain at about 6,500 ft., A. A. Beetle 11217. Labrador to British Columbia, and southward to Connecticut, Indiana, South Dakota, and Colorado.

3. Oryzopsis exigua Thurb. Little Ricegrass

Dry, rocky slopes and canyons at middle to higher elevations, in southeastern and western Wyoming. Montana to Washington, and southward to Colorado, Nevada, and Oregon.

4. Oryzopsis hymenoides (Roem. & Schult.) Ricker Indian Ricegrass

Two varieties occur in Wyoming: var. hymenoides, the common phase having broad panicles with divaricate ultimate divisions, and var. contracta B. L. Johnson (type E. Nelson 4850 from Freezeout Hills, Carbon County), having contracted panicles, the branches and pedicels erect, and found occasionally in southeastern and central Wyoming. The var. contracta has been confused with X Stiporyzopsis bloomeri (Boland.) Johnson, which is sterile, whereas var.
contracta is fertile and has a diploid chromosome complement of 48 which is also true of var. hymenoides.

Dry plains, foothills, and canyons at lower to middle elevations, about 4,000-8,000 ft., and common throughout most of Wyoming, Manitoba to British Columbia, and southward to Texas, California, and northern Mexico.

5. Oryzopsis micrantha (Trin. & Rupr.) Thurb. Littleseed Ricegrass

Rocky hills and canyons at mostly middle elevations, about 5,000-9,000 ft., in eastern and southeastern Wyoming, Saskatchewan to Montana, and southward to New Mexico and Arizona.

40. Stipa L. Needlegrass

Mostly tufted perennials with narrow or convolute blades and narrow or sometimes open panicles. Spikelets 1-flowered, disarticulating above the glumes obliquely so as to produce a bearded, sharp-pointed callus at the base of the floret. Glumes narrow, membranaceous or papery, acute, acuminate, or aristate. Lemma narrow and terete, strongly convolute and hardened (indurate) around the palea and the fruit, with a single, conspicuous, persistent awn at its apex.

The sharp-pointed fruits of some species cause mechanical injury to livestock, and Stipa robusta is known to be somewhat narcotic.

**KEY TO THE SPECIES**

1. Awn plumose throughout, 12-18 cm. long .......................... 1. S. neomexicana

1. Awn not plumose throughout, shorter

2. Lemma with an awn 55 mm. or more long, the body of the lemma 8 mm. or more long

3. Body of lemma dark brown at maturity, 16-25 mm. long ............ 2. S. spartea

3. Body of lemma pale straw-colored at maturity, 8-12 mm. long ... 3. S. comata

2. Lemma with an awn 50 mm. or less long, the body of the lemma 7 mm. or less long

4. Panicle open and diffuse ................................................ 4. S. richardsonii

4. Panicle contracted, narrow

5. Basal segment of awn plumose ....................................... 5. S. occidentalis

5. Basal segment of awn not plumose but sometimes pubescent

6. Hairs near summit of lemma about 2 mm. long, forming a conspicuous tuft exceeding the body of the lemma .................. 6. S. pinetorum
6. Hairs near summit of lemma shorter, not forming a conspicuous tuft

7. Lower sheaths pubescent all over ........................................ 7. *S. williamsii*

7. Lower sheaths glabrous or only ciliate on margins or villous at the throat

8. Sheaths villous at the throat; lower nodes of panicles villous

9. Plants mostly less than 10 dm. high; panicle loose, mostly 10-20 cm. long, not interrupted below ....................... 8. *S. viridula*

9. Plants mostly more than 10 dm. high; panicle dense, mostly 25-40 cm. long, often interrupted below .......... 9. *S. robusta*

8. Sheaths not villous at the throat; lower nodes of panicles glabrous or nearly so

10. Hairs at summit of lemma not longer than those below; awn more than 20 mm. long ..................... 10. *S. columbiana*

10. Hairs at summit of lemma longer than those below; awn less than 20 mm. long ........................................ 11. *S. lettermanii*

1. **Stipa neomexicana** (Thurb.) Scribn.  New Mexican Feathergrass

   Dry, rocky slopes and canyons at lower elevations, our two records from Platte County at about 4,400 ft. Eastern Wyoming southward to Colorado, Texas, and Arizona, and westward to Utah.

2. **Stipa spartea** Trin.  Porcupine Grass

   Dry prairies and foothills at lower elevations, about 4,000-6,500 ft., and seen only from northeastern Wyoming. Ontario to British Columbia, and southward to Pennsylvania, Indiana, Kansas, and New Mexico.

3. **Stipa comata** Trin. & Rupr.  Needle-and-thread

   Two varieties occur in Wyoming: the typical and common var. *comata*, with a flexuous or curled terminal segment of the awn, and the whole awn about 10-15 cm. long; and the occasional var. *intermedia* Scribn. & Tweedy, based on *Tweedy 610* from Junction Butte, Yellowstone National Park, in which the terminal segment of the awn is straight and the whole awn is a little shorter, about 7 cm. long.

   Common on dry prairies and foothills, at lower to middle elevations, up to about 8,000 ft., and generally distributed over Wyoming, Indiana to Yukon Territory, and southward to Texas and California.

4. **Stipa richardsonii** Link  Richardson Needlegrass

   Rather dry woodlands and meadows, usually at middle elevations, about 6,000-8,000 ft., and generally scattered over Wyoming but
apparently more common in the northern part. Saskatchewan and British Columbia southward to Colorado.

5. **Stipa occidentalis** Thurb.  Western Needlegrass
Occasional on dry, open ridges and hills at middle elevations, about 6,000-8,000 ft., in the western two-thirds of Wyoming. Ranging from Wyoming to Washington, and southward to Arizona and California.

6. **Stipa pinetorum** Jones
Dry mountain slopes and open coniferous forest, at middle to higher elevations, about 7,000-10,000 ft., and occasional in western Wyoming, our records from Sublette and Sweetwater counties. Wyoming, Colorado, Utah, Nevada, and California.

7. **Stipa williamsii** Scribn.  Williams Needlegrass
Dry, open or wooded slopes, at middle elevations, about 6,000-8,500 ft., in north central and western Wyoming. Montana to Washington, and southward to Colorado and California.

8. **Stipa viridula** Trin.  Green Needlegrass
Dry prairies and hills, at lower to middle elevations, about 3,500-7,500 ft., in the eastern half of Wyoming. New York to Wisconsin and Alberta, and southward to Kansas and New Mexico.

9. **Stipa robusta** (Vasey) Scribn.  Sleepy-grass
Dry prairies and plains in southeastern Wyoming, our occasional records from along roadsides and probably introduced by hay trucks from Colorado. Southeastern Wyoming to northern New Mexico, western Texas, and Arizona.

10. **Stipa columbiana** Macoun  Columbia Needlegrass
Two varieties occur in Wyoming: the typical var. *columbiana* which is the more common, and var. *nelsonii* (Scribn.) Hitchc., based on A. Nelson 3963 from Albany County, in which the plants are more robust, up to 1 m. tall, with larger and denser panicles, the lemmas 6-7 mm. long, and awns up to 35 mm. long.

Common on dry plains, in meadows, and on foothills, ascending up to about 9,000 ft. in the mountains, and common throughout most of Wyoming except perhaps for the northeastern part. South Dakota to Yukon Territory, and southward to Texas and California.

11. **Stipa lettermanii** Vasey  Letterman Needlegrass
Open slopes and woods at middle elevations, about 6,000-8,000 ft., mainly in the western half of Wyoming. Our plants tend to inter-
grade with *S. pinetorum* in the degree of development of the hairs at the summit of the lemma. Montana and Oregon southward to New Mexico and California.

41. *Aristida* L. Three-awn

Slender, tufted perennials, in ours, with narrow or convolute blades and narrow, bristly panicles. Spikelets 1-flowered, disarticulating above the glumes obliquely so as to produce a bearded, sharp-pointed callus at the base of the floret. Glumes unequal, in ours, long and narrow, membranaceous or papery, acute, acuminate, or aristate. Lemma narrow and terete, strongly convolute and hardened (indurate), falling attached to the fruit, with three conspicuous awn-branches from its apex.

**KEY TO THE SPECIES**

Leaves mostly in a curly, basal tuft; awns about 20-30 mm. long ..... 1. *A. fendleriana*

Leaves not conspicuously basal; awns about 50-80 mm. long .............. 2. *A. longiseta*

1. *Aristida fendleriana* Steud. Fendler Three-awn

Dry, sandy or rocky plains and hills, up to about 7,000 ft., from southeastern to central Wyoming. South Dakota to Montana, and southward to Texas, Utah, and southern California.

2. *Aristida longiseta* Steud. Red Three-awn

Dry plains and foothills, up to about 6,000 ft., and mostly along the eastern plains of Wyoming, but also present in the Owl Creek Range, Hot Springs County. North Dakota to Montana, and southward to Texas, Arizona, and northern Mexico.

**Tribe 5. Oryzeae Rice Tribe**

Aquatic, often tall grasses, with flat blades and open panicles. Spikelets 1-flowered, laterally flattened, and disarticulating below the very small, narrow glumes. Lemma rigid, 5-nerved, keeled.

42. *Leersia* Swartz

Our only genus, with characters as given for the tribe.

1. *Leersia oryzoides* (L.) Swartz Rice Cutgrass

Occasional in wet places on the southeastern plains, our two records from Goshen County at about 4,600 ft. Maine to British Columbia
and eastern Washington, and southward to northern Florida, Texas, Colorado, Arizona, and southeastern California; Europe.

**Tribe 6. Chlorideae**  
**Grama Tribe**

Spikelets 1-several-flowered, sessile, on one side of a continuous rachis, the inflorescence composed of one or more 1-sided spikes which may be single, racemose, or digitate on the culm. Articulation above or below the glumes.

**KEY TO THE GENERA**

1. Plants neither dioecious nor stoloniferous; spikelets all alike

2. Annuals

3. Plants erect, with exserted inflorescences; leaves not pungent; in wet places .......................... 44. BECKMANNIA

3. Plants mat-forming, with included inflorescences; leaves bristle-pointed, pungent; in dry, sandy soils .................................................. 47. MUNROA

2. Perennials

4. Spikelets distant on the rachis, not crowded, appressed to the rachis .......................... 43. SCHEDONNARDUS

4. Spikelets crowded on the rachis, not appressed

5. Spikelets with a single, perfect floret, green or straw-colored .......................... 45. SPARTINA

5. Spikelets with 1 perfect floret and 1 or more sterile florets above it, often purplish .......... 46. BOUTELOUA

1. Plants dioecious and stoloniferous, forming a continuous sod; spikelets of 2 kinds, the staminate in single, small, 1-sided spikes, the pistillate among the leaves and bur-like ................................................. 48. BUCHLOE

43. Schedonnardus Steud.  
**Tumblegrass**

A tufted perennial with flat, wavy blades crowded at the base of the plant, and an open, exserted inflorescence of stiff, slender, divergent, 1-sided spikes of rather distant and appressed, 1-flowered spikelets. Glumes narrowly lanceolate, stiff, somewhat unequal in length, 1-nerved. Lemmas narrow, acuminate, slightly exceeding the glumes, 3-nerved. Articulation above the glumes.

1. Schedonnardus paniculatus (Nutt.) Trel.

Dry prairies and badlands at lower elevations, about 4,000-6,000 ft., in eastern and northern Wyoming. Illinois to Saskatchewan and Montana, and southward to Texas and Arizona; Argentina.
44. **Beckmannia** Host.  **Sloughgrass**

An erect, coarse annual of wet places, with flat blades and a narrow, exserted, paniculate inflorescence composed of numerous, ascending or appressed, 1-sided spikes. Spikelets 1-flowered, laterally flattened, nearly circular, closely imbricated in two rows along one side of a continuous rachis. Glumes equal, inflated, obovate, 3-nerved, apiculate. Lemma narrow, acuminate, 5-nerved, about equaling the glumes. Articulation below the glumes.

1. **Beckmannia syzigachne** (Steud.) Fern.

Moist stream banks, ditches, and ponds, at lower to middle elevations, about 3,500-8,000 ft., and common throughout Wyoming. Manitoba to Alaska, and southward to Illinois, Kansas, New Mexico, northern Arizona, and California; New York, Ohio; Asia.

45. **Spartina** Schreb.  **Cordgrass**

Erect, low to tall and stout perennials with creeping, scaly rhizomes, in ours, with long, flat blades, and an inflorescence consisting of two or more appressed or spreading, 1-sided spikes in an exserted raceme. Spikelets 1-flowered, strongly laterally flattened, closely imbricate on the rachis. Glumes keeled, 1-nerved, unequal in length, lanceolate-acuminate, awned or awnless. Lemma keeled, with a prominent midnerve but obscure lateral nerves. Articulation below the glumes.

**KEY TO THE SPECIES**

| Glumes awned; culms 10-20 dm. high | 1. **S. pectinata** |
| Glumes awnless; culms 6-10 dm. high | 2. **S. gracilis** |

1. **Spartina pectinata** Link  **Prairie Cordgrass**

Marshes, stream banks, and ditches at lower to middle elevations, about 3,500-7,000 ft., in the eastern half of Wyoming. Newfoundland and Quebec to Oregon and eastern Washington, and southward to North Carolina, Kentucky, Illinois, Arkansas, Texas, and New Mexico.

2. **Spartina gracilis** Trin.  **Alkali Cordgrass**

Dry, sandy or alkaline plains and valleys at about 4,500-7,500 ft., and generally distributed in Wyoming. Saskatchewan to British Columbia, and southward to Colorado and Arizona.

46. **Bouteloua** Lag.  **Grama**

Perennials, in ours, with one, a few, or many 1-sided spikes produced in an exserted raceme, the spikes not strongly appressed to the
axis of the raceme. Spikelets with 1 perfect floret and 1 or more sterile or reduced florets above it. Glumes slender and acuminate, unequal in length, 1-nerved. Lemma equaling or exceeding the glumes, 3-nerved, usually with 3 or more awns or teeth at the apex. Articulation above or below the glumes.

KEY TO THE SPECIES

Spikes of the raceme numerous, 6-20 mm. long, pendulous, falling entire; plants with scaly rhizomes .......................................................... 1. B. curtipendula

Spikes 1-4, longer, divergent or ascending, persistent; plants without scaly rhizomes

   Rachis prolonged beyond the spikelets of the 1-sided spikes as a naked point; spikes about 1-2 cm. long ................................................. 2. B. hirsuta

   Rachis not prolonged beyond the spikelets; spikes about 2-4 cm. long ......................................................... 3. B. gracilis

1. Boueloua curtipendula (Michx.) Torr. Side-oats Grama

Dry plains and foothills at lower elevations, about 3,500-6,000 ft., in eastern Wyoming, Maine and Ontario to Montana, and southward to Maryland, Alabama, Texas, Arizona, and southern California.

2. Boueloua hirsuta Lag. Hairy Grama

Plains and rocky foothills, often in rocky soils, and seen only from extreme southeastern Wyoming at about 5,000 ft. Wisconsin and South Dakota to Texas, Colorado, Arizona, and California; Mexico and peninsular Florida.


Dry plains and hills, at lower to middle elevations, about 3,500-8,500 ft., and common in eastern and northern Wyoming, and perhaps common throughout the state. Wisconsin to Manitoba and Alberta, and southward to Missouri, Texas, and southern California; Mexico.

47. Munroa Torr. False Buffalo Grass

Prostrate, mat-forming, spreading annual, much-branched, with short, flat, pungent leaves, the inflorescences partly hidden in the upper sheaths. Spikelets in pairs or threes, somewhat 1-sided on a short rachis, the lower spikelets larger and 3-4-flowered, the upper smaller and 2-3-flowered, a group of about three short spikes clustered at the ends of the branches. Glumes of the lower spikelets subequal, those of the upper
spikelets very unequal in length, all 1-nerved. Lemmas 3-nerved, acuminate, slightly exceeding the glumes. Articulation above the glumes.

1. **Munroa squarrosa** (Nutt.) Torr.

Dry, sandy soils of river bottoms, roadsides, and waste ground at lower elevations, up to about 5,500 ft., in eastern and north-central Wyoming. The plants may sometimes appear to be white-floccose because of an infestation by a wooly aphid. Alberta and North Dakota to Montana, and southward to Texas and Arizona.

48. **Buchloë Engelm.** Buffalo Grass

A low, stoloniferous, dioecious perennial, with short blades, the staminate plants with an exserted, erect inflorescence of 2 or 3 short, 1-sided spikes and bright orange anthers, the pistillate plants with a bur-like cluster of spikelets hidden among the leaves. Staminate spikelets 2-flowered, the glumes unequal in length, 1-nerved, the lemmas exceeding the glumes, 3-nerved, the articulation above the glumes. Pistillate spikelets clustered in groups of 4 or 5, 1-flowered, the glumes unequal in length, the second glume thick and rigid, wrapped around the floret, and rigidly 3-toothed at the apex, the lemma thinner in texture, 3-nerved, and 3-toothed or 3-lobed at the apex, the articulation below the glumes, the spikelet cluster falling entire.

1. **Buchloë dactyloides** (Nutt.) Engelm.

Dry plains and foothills, at lower elevations, about 3,500-5,000 ft., in eastern Wyoming east of the Laramie Range and northward to the Black Hills of Crook County. Western Minnesota to central Montana, and southward to northwestern Iowa, Texas, western Louisiana, Arizona, and northern Mexico.

**Tribe 7. Zoysieae** Curly Mesquite Tribe

Spikelets sessile or subsessile, in groups, the whole group falling entire from the rachis at maturity, the articulation below the glumes, and the inflorescence a single, symmetrical spike.

49. **Hilaria H.B.K.**

Perennials of dry plains and deserts, from a rhizomatous base in ours, with a simple, terminal, symmetrical spike, the spikelets sessile, in groups of 3, the central spikelet of each group fertile and the lateral
spikelets sterile, the group falling together from the slender rachis. Glumes coriaceous and unsymmetrical, with awns thus apparently from the sides but actually coming from the midnerves. Lemmas and paleas hyaline, subequal, obtuse or truncate at the apex.

1. Hilaria jamesii (Torr.) Benth. Galleta

Occasional in the desert areas of southern Wyoming, at about 4,000-7,000 ft. Wyoming and Utah to Texas and California.

Tribe 8. Phalarideae Carnary-grass Tribe

Spikelets with 1 perfect, terminal floret and below this 2 sterile florets, the sterile florets being either staminate or empty lemmas that equal the fertile lemma in size, or the sterile florets reduced to a pair of minute, hairy scales that fall attached to the base of the fertile floret. Articulation above the glumes. Inflorescence an open or a spike-like panicle.

KEY TO THE GENERA

Inflorescence an open panicle; spikelets bronze-colored and shining; sterile lemmas staminate and as large as the fertile lemma ........................................ 50. Hierochloë

Inflorescence a narrow, spike-like panicle; spikelets greenish or straw-colored and dull; sterile lemmas reduced to 2 minute, empty scales much smaller than the fertile lemma and falling with it ........................................ 51. Phalaris

50. Hierochloë R. Br.

Erect, fragrant perennials from rhizomes, with open panicles of bronze-colored, shining spikelets. Each spikelet with 1 perfect, terminal floret and 2 similar but staminate florets below it, the sterile lemmas appearing like a second pair of glumes. Glumes equal, broad and papery. 3-nerved. Staminate lemmas boat-shaped, equaling the glumes, with hairy margins. Fertile lemma similar and slightly indurated. Palea 3-nerved and rounded on the back.

1. Hierochloë odorata (L.) Beauv. Sweetgrass

Moist meadows in the mountains, at middle to higher elevations, about 6,000-10,000 ft., and scattered over most of Wyoming except for the southwestern part. Labrador to Alaska, and southward to New Jersey, Indiana, Iowa, and Oregon, and in the mountains to New Mexico and Arizona; Eurasia.
51. *Phalaris* L.  Canary-grass

Annuals or perennials with narrow or spike-like panicles of dull, greenish or straw-colored spikelets. Each spikelet with 1 perfect, terminal floret and 2 very small, scale-like lemmas below it, the sterile lemmas hairy and falling attached to the fertile floret. Glumes equal, keeled, the keel sometimes winged. Fertile lemma indurate, shorter than the glumes, enclosing the 2-nerved palea and the grain.

**KEY TO THE SPECIES**

Plants annual; panicles 2-3 cm. long; glumes with a broad, prominent wing .......................................................... 1. *P. canariensis*

Plants perennial; panicles 6-20 cm. long; glumes very narrowly winged .......................................................... 2. *P. arundinacea*

1. *Phalaris canariensis* L.  Canary-grass

Occasionally introduced, probably with birdseed, at mostly lower elevations in eastern Wyoming. Widely introduced in North America from the Old World; native of the western Mediterranean region.

2. *Phalaris arundinacea* L.  Reed Canary-grass

Moist ditches, stream banks, and margins of ponds and lakes, at lower to middle elevations, about 3,500-7,500 ft., and common throughout most of Wyoming. New Brunswick to Alaska, and southward to North Carolina, Kentucky, Oklahoma, New Mexico, Arizona, and northeastern California; Eurasia.

**Tribe 9. Paniceae  Millet Tribe**

Spikelets with 1 perfect, terminal floret and 1 sterile (empty) lemma below it. Rachilla joints very short. Glumes thin, the first very small, the second glume and sterile lemma similar in size and texture so as to appear like a pair of glumes. Fertile lemma and palea indurate, subteterete or dorsally flattened. Articulation below the glumes. Inflorescence an open panicle, or of one to several racemes that are digitate or racemose on the main axis.

**KEY TO THE GENERA**

1. Spikelets enclosed by a deciduous, bur-like involucre with barbed spines .......................................................... 56. *Cenchrus*
1. Spikelets not enclosed by a bur-like involucre, the inflorescence sometimes bristly but not spiny

2. Inflorescence bristly and spike-like, the spikelets subtended by persistent, hair-like bristles .............................................. 55. SETARIA

2. Inflorescence neither bristly nor spike-like, the spikelets not subtended by bristles

3. Sterile lemma mucronate to awned, stiff-hairy .......... 54. ECHINOCHLOA

3. Sterile lemma neither mucronate nor awned, not stiff-hairy

4. Inflorescence of narrow, digitate racemes .................................. 52. DIGITARIA

4. Inflorescence an open panicle .................................................. 53. PANICUM

52. Digitaria Heister Crabgrass

Annuals, in ours, with soft, flat blades, membranaceous ligules, and spikelets in slender racemes that are digitate or nearly so on the ends of the culms. Spikelets lanceolate to elliptic in outline, planoconvex, short-pedicled, the first glume very minute, the second glume and sterile lemma subequal, the fertile lemma cartilaginous, with pale and hyaline margins. Articulation below the glumes.

KEY TO THE SPECIES

Sheaths pilose; sterile lemma without glandular hairs;
fertile lemma pale green ................................................................. 1. D. sanguinalis

Sheaths glabrous; sterile lemma with glandular hairs;
fertile lemma dark brown ................................................................. 2. D. ischaemum

1. Digitaria sanguinalis (L.) Scop. Crabgrass

An occasional weed in lawns and gardens at lower elevations. Widely introduced throughout the United States from Europe.

2. Digitaria ischaemum (Schreb.) Muhl. Smooth Crabgrass

An occasional weed in lawns and gardens at mostly lower elevations. Introduced in the United States from Eurasia.

53. Panicum L. Panicum

Annuals or perennials of various habit, with mostly open panicles, the spikelets glabrous or pubescent, awnless, not hispid, and not in 1-sided clusters, somewhat dorsally flattened or nearly terete. First glume small; second glume and sterile lemma subequal, strongly nervet; fertile lemma hardened (indurate) and nerveless, the margins inrolled and partially enclosing the palea and the grain. Articulation below the glumes.
KEY TO THE SPECIES

1. Annuals

2. Panicle nodding, compact; spikelets 4.5-5 mm. long .......................... 1. P. miliaceum
2. Panicle erect, diffuse; spikelets 1.2-5 mm. long .................................. 2. P. capillare

1. Perennials

3. Rhizomes lacking; culms 1-5 dm. high; plants forming winter rosettes or mats; spikelets 3.3 mm. or less long
   4. Sheaths densely villous; spikelets 1.4-1.7 mm. long; found only near thermal areas in northwestern Wyoming ................................. 3. P. thermale
   4. Sheaths slightly pubescent to glabrous; spikelets 3.2-3.3 mm. long; not confined to thermal areas and only in northeastern Wyoming ................................................. 4. P. scribnerianum

3. Rhizomes present; culms 10-20 dm. high; plants not forming winter rosettes; spikelets 3.5-5 mm. long ................................................................. 5. P. virgatum

1. Panicum miliaceum L. Broom-corn Millet

An occasional weed in waste places, our single record from Laramie, Albany County, at about 7,200 ft. Mainly in the northeastern United States, and occasional elsewhere; Europe and western Asia.

2. Panicum capillare L. Witchgrass

Our plants are mostly var. occidentale Rydb., having somewhat shorter, less pubescent blades that are more crowded toward the base of the plant, and spikelets up to 3.3 mm. long, as compared with the typical var. capillare which is only occasional in Wyoming.

Roadsides, fields, and waste ground, at lower to middle elevations, about 3,500-8,000 ft., and generally distributed in Wyoming except for the southwestern part. Maine to Montana, and southward to Florida, Texas, and California, the var. occidentale extending into Canada and more common westward.

3. Panicum thermale Boland.

Wyoming plants have been referred to P. ferventicaola Schmoll, based on a collection by Chase from Norris Geyser Basin, Yellowstone National Park. A collection, A. & E. Nelson 6037, from Mammoth Hot Springs, is the type of P. ferventicaola var. sericeum Schmoll. Both of these are conspecific with P. thermale.

About hot springs and geysers, at about 7,000-8,000 ft., in Yellowstone National Park and adjacent Teton County. Alberta to Washington, and southward to northwestern Wyoming, Utah, and California.

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4. *Panicum scribnerianum* Nash

By some authors this species is merged with the eastern *P. oligosanthes* Schult., a closely related species.

Dry, usually sandy soils of open forests or bottomlands, at mostly lower elevations in northeastern Wyoming. Maine to British Columbia, and southward to Maryland, Tennessee, Texas, Arizona, and northern California.

5. *Panicum virgatum* L. Switchgrass

Sandy plains and bottomlands at mostly lower elevations, about 4,000-6,000 ft., in southeastern Wyoming. Quebec and Maine to Montana, and southward to Florida, Arizona, and Nevada; Mexico and Central America.

54. *Echinochloa* Beauv. Barnyard-grass

Coarse annuals with flat blades, without ligules, having rather dense, open panicles in which the spikelets are in somewhat 1-sided clusters on the branches and are bristly or hispid. First glume about half the length of the spikelet; second glume and sterile lemma subequal in length, the sterile lemma awned or at least mucronate in ours. Fertile lemma smooth and shining, with inrolled margins below, partially enclosing the smooth palea and the grain.


The typical var. *crusgalli* has awns on the sterile lemmas 5 mm. or more long, and occurs occasionally in Wyoming. Our more common plant is var. *mitis* (Pursh) Peterm., in which the awns are much reduced to almost lacking.

A rather common weed in cultivated and waste ground at elevations up to about 7,000 ft., in the eastern half of Wyoming and perhaps to be encountered in other cultivated areas. Throughout most of the United States and southern Canada; Eastern Hemisphere.

55. *Setaria* Beauv. Bristlegrass

Annuals, in ours, with flat blades, hairy ligules, and cylindrical, dense, bristly panicles, the bristles representing sterile branchlets that are persistent and subtend the awnless spikelets. First glume short; second glume and sterile lemma subequal, several-nerved; fertile lemma hardened (indurate) and finely rugose at maturity. Articulation below the glumes.

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KEY TO THE SPECIES

Bristles 5-20 in a cluster below each spikelet, antrorsely scabrous, becoming yellow or orange at maturity; fruit strongly rugose ............................. 1. *S. lutescens*

Bristles 1-3 in a cluster below each spikelet, antrorsely or retrorsely scabrous, remaining green or straw-colored at maturity; fruit finely rugose

Bristles retrorsely scabrous ........................................ 2. *S. verticillata*

Bristles antrorsely scabrous ........................................ 3. *S. viridis*

1. *Setaria lutescens* (Weigel) F. T. Hubbard  Yellow Bristlegrass
   An occasional weed, seen only from Big Horn County at about 3,800 ft. Widely introduced in the United States from Europe.

   An occasional weed, seen only from Hot Springs County, near the hot springs at Thermopolis. Widely introduced in the United States and tropical America from Europe.

   A common weed at elevations up to about 7,000 ft. Throughout the cooler parts of the United States and southern Canada; Mexico; introduced from Europe.

56. *Cenchrus* L.  Sandbur

Prostrate or spreading annuals, in ours, with flat blades, the ligule dense tuft of short hairs. Spikelets enclosed in a bur-like, spiny involucre, these in a somewhat crowded, narrow raceme and readily deciduous from the main axis. First glume less than half the length of the spikelet; second glume a little shorter than the sterile lemma which is a little shorter than the fertile lemma; usually two such spikelets permanently enclosed in each bur.

1. *Cenchrus pauciflorus* Benth.  Field Sandbur
   A common and troublesome weed in dry, sandy soils at mostly lower elevations in southeastern Wyoming, and also seen from the Grand Canyon of the Snake River in southern Teton County. Throughout most of the United States and in Ontario, the Mexican plateau, coastal regions of tropical America, and southern South America.

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Tribe 10. Andropogoneae  Sorghum Tribe

Spikelets commonly in pairs, one perfect and sessile, the other sterile or reduced and pedicellate, both borne on a jointed and often hairy rachis, each pair falling with a joint of the rachis, the articulation below the glumes. Fertile spikelets with 1 perfect, terminal floret and a sterile floret below it. Glumes hardened (indurate), enclosing the florets. Lemmas thin. Paleas reduced. Each rachis, with its paired spikelets, is referred to as a raceme, and these racemes may be digitate or racemose on the culms, or in *Sorghum* and *Sorghastrum* they are reduced to one or two joints and these form a panicle.

**KEY TO THE GENERA**

Inflorescence an elongated raceme of paired spikelets, the racemes either digitate or racemose on the culms .......................................................... 57. ANDROPOGON

Inflorescence an open panicle, the racemes reduced to a single pair of spikelets

Sterile, pedicellate spikelet present .......................................................... 58. SORGHUM

Sterile, pedicellate spikelet, lacking, only the pedicel remaining .......................................................... 59. SORGHASTRUM

57. Andropogon L.  Beardgrass

Coarse perennials, often purplish, with spikelets paired on a bearded, jointed axis, one member of each pair sessile and fertile, the other sterile and pedicellate, the pair falling together with a joint of the axis, and these racemes aggregated into a digitate inflorescence or scattered along the culm and racemose. Fertile spikelet with a pair of coriaceous glumes that enclose a thin, empty lemma and a narrow, hyaline, fertile lemma which often bears a bent awn.

**KEY TO THE SPECIES**

Racemes racemose on the culms, 3-6 cm. long; culms 3-10 dm. high .... 1. *A. scoparius*

Racemes digitate or approximate on the culms, 5-10 cm. long; culms 10-20 dm. high

Rhizomes short or none; awns of fertile spikelets 10-20 mm. long .... 2. *A. gerardi*

Rhizomes creeping; awns of fertile spikelets 5 mm. or less long ........ 3. *A. hallii*

1. Andropogon scoparius Michx.  Little Bluestem

Dry prairies and hills, at lower to middle elevations, about 3,500-7,500 ft., and fairly common in Wyoming as far west as Sheridan and Hot Springs counties. Quebec and Maine to Alberta and Idaho, and southward to Florida and Arizona.
2. **Andropogon gerardi** Vitman  Big Bluestem

Dry prairies and hills, at lower elevations, about 3,500-5,000 ft., in southeastern and northern Wyoming, extending westward to Sheridan County in the north and to northeastern Albany County in the south. The plants are especially common along the Oregon Trail in eastern Wyoming and may have been introduced by wagon trains there. Quebec and Maine to Saskatchewan and Montana, and southward to Florida, Colorado, Utah, and Arizona; Mexico.

3. **Andropogon hallii** Hack.  Turkeyfoot

Dry prairies and hills, at lower elevations, about 4,000-5,000 ft., on the eastern plains of Wyoming. North Dakota and eastern Montana southward to Texas, Colorado, Utah, and Arizona; also in Iowa.

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58. **Sorghum** Moench  Sorghum

Tall annuals or perennials with flat blades and paired spikelets in open, terminal panicles, one member of the spikelet pair sessile and fertile, the other sterile and pedicellate except for the terminal, sessile spikelet which has two sterile, pedicellate spikelets in connection with it.

**KEY TO THE SPECIES**

Plants rhizomatous perennials; culms 1-2 m. high .................. 1. *S. halepense*

Plants annuals; culms 2-3 m. high .................................. 2. *S. bicolor*

1. **Sorghum halepense** (L.) Pers.  Johnson-grass

Occasionally cultivated for forage at lower elevations. Cultivated and sometimes becoming weedy in the eastern and southern United States; native of the Mediterranean region and found in warmer parts of both hemispheres.

2. **Sorghum bicolor** (L.) Moench  Sorghum

There are many cultivated varieties of this grass, one of which is Sudan-grass, occasionally cultivated for forage. For technical reasons, the name *Sorghum vulgare* Pers., long used for this species, must be discarded for the name given above. For a discussion of the nomenclature involved see Baileya 4:141-142, 1956.

Occasionally cultivated and perhaps escaped, at lower elevations. Widely cultivated in warmer parts of the world; native of the Old World.
59. Sorghastrum Nash

Tall perennials with narrow, flat blades and paired spikelets in narrow or open, terminal panicles, one member of the spikelet pair sessile and fertile, the other represented only by a hairy pedicel. First glume coriaceous and hisrute, its edge wrapped around the second glume. Sterile and fertile lemmas thin, the fertile lemma with a prominent, bent awn.

1. Sorghastrum nutans (L.) Nash   Indian-grass

Dry prairies at lower elevations, and to be expected in eastern Wyoming but no collections seen. Quebec and Maine to Manitoba and North Dakota, and southward to Florida and Arizona; Mexico.

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