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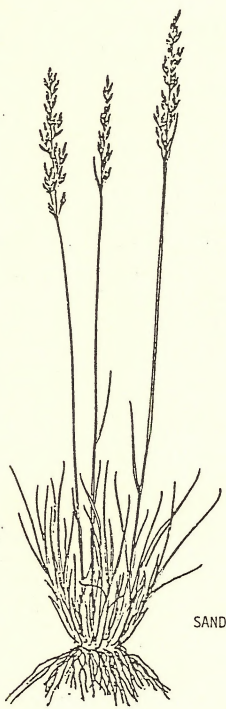
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A KEY TO COMMON
GRASSES OF NORTHEASTERN NEVADA

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by
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SANDBERG BLUEGRASS

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This key has been abstracted from three primary sources: the section on species identification by vegetative characteristics is from C. L. Hitchcock, et al., "Vascular Plants of the Pacific Northwest, Part 1"; the key to grass tribes, genera and species based on floral characters is adapted from A. S. Hitchcock's, "Manual of the Grasses of the United States", USDA-Misc. Pub. No. 200; the narrative descriptions and drawings of individual grass species are taken from A. Cronquist, et al., "Intermountain Flora, Vol. 6".

This work is intended for use as a field tool for SCS and BLM personnel involved in rangeland resource inventories and National Cooperative Soil Surveys in northeastern Nevada.

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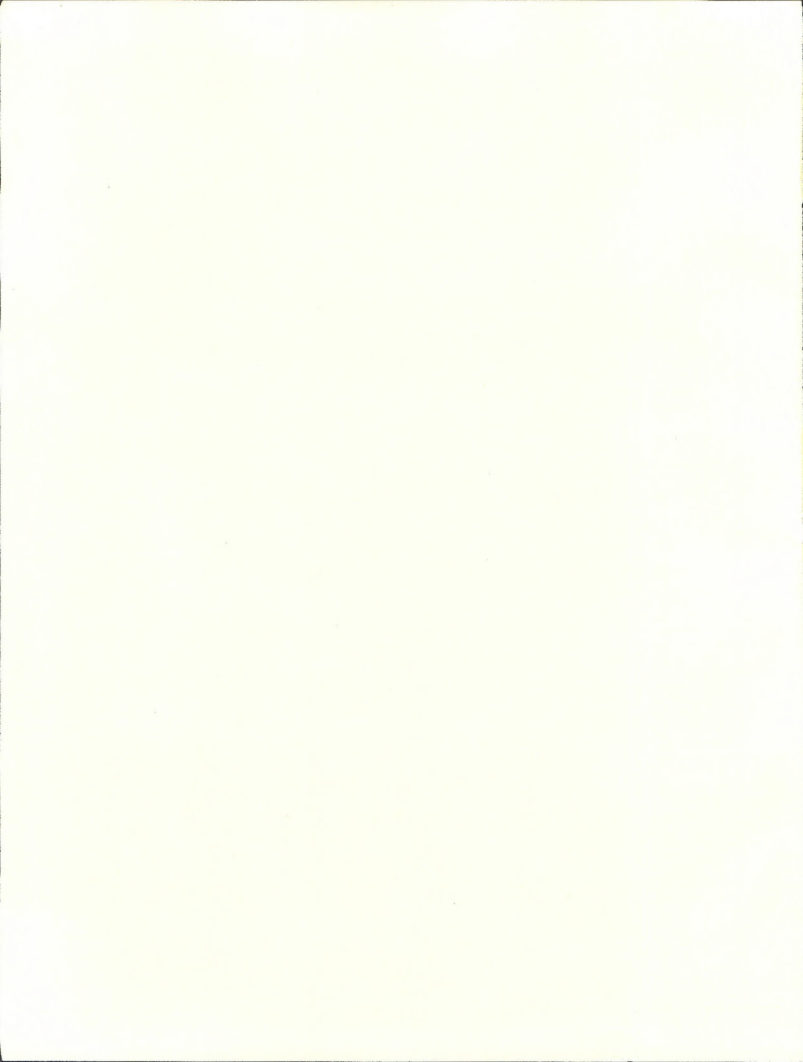
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QUICK REFERENCE TO
GRASS SPECIES IN THIS KEY

SCIENTIFIC NAME	SYMBOL	NEVADA COMMON NAME
<i>Agropyron dasystachyum</i>	AGDA	thickspike wheatgrass
<i>Agropyron riparium</i> (see <i>A. dasystachyum</i> variety <i>riparium</i>)	AGRI	streambank wheatgrass
<i>Agropyron smithii</i>	AGSM	western wheatgrass
<i>Agropyron spicatum</i>	AGSP	bluebunch wheatgrass
<i>Agropyron subsecundum</i>	AGSU	bearded wheatgrass
<i>Agropyron trachycaulum</i>	AGTR	slender wheatgrass
<i>Agrostis alba</i>	AGAL3	redtop
<i>Bromus marginatus</i>	BRMA4	mountain brome
<i>Bromus tectorum</i>	BRTE	cheatgrass
<i>Danthonia californica</i>	DACA3	California oatgrass
<i>Danthonia unispicata</i>	DAUN	onespike oatgrass
<i>Deschampsia caespitosa</i>	DECA5	tufted hairgrass
<i>Deschampsia elongata</i>		slender hairgrass
<i>Distichus stricta</i>	DIST	inland saltgrass
<i>Elymus ambiguus</i>		Colorado wildrye
<i>Elymus cinereus</i>	ELCI2	basin wildrye
<i>Elymus glaucus</i>	ELGL	blue wildrye
<i>Elymus triticoides</i>	ELTR3	creeping wildrye
<i>Festuca idahoensis</i>	FEID	Idaho fescue
<i>Hesperochloa kingii</i>	HEKI	spike fescue
<i>Hilaria jamesii</i>	HIJA	galleta
<i>Hordeum brachyantherum</i>	HOBR2	meadow barley
<i>Hordeum jubatum</i>	HOJU	foxtail barley
<i>Melica bulbosa</i>	MEBU	bulbous oniongrass
<i>Melica spectabilis</i>	MESP	showy oniongrass (purple oniongrass)
<i>Muhlenbergia asperifolia</i>	MUAS	alkali muhly
<i>Muhlenbergia richardsonii</i>	MURI	mat muhly
<i>Oryzopsis hymenoides</i>	ORHY	Indian ricegrass
<i>Oryzopsis webberi</i>	ORWE	Webber ricegrass

SCIENTIFIC NAME	SYMBOL	NEVADA COMMON NAME
<i>Phleum alpinum</i>	PHAL2	alpine timothy
<i>Phleum pratense</i>	PHPR3	timothy
<i>Phragmites communis</i>	PHCO15	common reed
<i>Poa ampla</i>	POAM	big bluegrass
<i>Poa canbyi</i>	POCA	Canby bluegrass
<i>Poa cusickii</i>	POCU3	Cusick bluegrass
<i>Poa fendleriana</i>	POFE	muttongrass
<i>Poa juncifolia</i>	POJU	alkali bluegrass
<i>Poa nevadensis</i>	PONE3	Nevada bluegrass
<i>Poa pratensis</i>	POPR	Kentucky bluegrass
<i>Poa scabrella</i>	POSC	pine bluegrass
<i>Poa secunda</i> (<i>Poa sandbergii</i>)	POSE	Sandberg bluegrass
<i>Polypogon monspeliensis</i>	POMO5	rabbitfootgrass
<i>Puccinellia airoides</i>	PUAI	Nuttall alkaligrass
<i>Puccinellia lemmonii</i>		Lemmon alkaligrass
<i>Sitanion hystrix</i>	SIHY	bottlebrush squirreltail
<i>Sitanion jubatum</i>	SIJU	big squirreltail
<i>Spartina gracilis</i>	SPGR	alkali cordgrass
<i>Sporobolus airoides</i>	SPAI	alkali sacaton
<i>Sporobolus cryptandrus</i>	SPCR	sand dropseed
<i>Stipa columbiana</i>	STCO3	Columbia needlegrass
<i>Stipa comata</i>	STCO4	needleandthread
<i>Stipa lettermanii</i>	STLE4	Letterman needlegrass
<i>Stipa nevadensis</i>		Nevada needlegrass
<i>Stipa occidentalis</i>	STOC2	western needlegrass
<i>Stipa speciosa</i>	STSP3	desert needlegrass
<i>Stipa thurberiana</i>	STTH2	Thurber needlegrass

VEGETATIVE KEY TO SPECIES

- 1a. Ligules consisting partially or wholly of a fringe of hairs, the fringe usually at least as long as any basal membranous portion GROUP I
- 1b. Ligules entirely or mostly membranous, sometimes ciliate, erose, or lacerate but not fringed
 - 2a. Sheaths partially to completely closed from the base upward, the margins rarely overlapping where closed GROUP II
 - 2b. Sheaths open to, or nearly to, base; the margins usually overlapping
 - 3a. Blades folded in the bud (detectable in the innovations) the margins not overlapping, the tips prow-like; sheaths usually closed at the base, but rarely open the full length See GROUP II 5b
 - 3b. Blades usually rolled in the bud, the tips nearly always flat, or at least not prow-like
 - 4a. Auricles present on at least some of the leaves GROUP III
 - 4b. Auricles lacking on all leaves
 - 5a. Culms solid GROUP IV
 - 5b. Culms hollow
 - 6a. Plants rhizomatous, the rhizomes often very extensive GROUP V
 - 6b. Plants tufted not rhizomatous
 - 7a. Culms [±] swollen and somewhat bulbous at base; blades 4-10 mm broad; plants mostly 6-15 dm tall; introduced, moist areas Phleum pratense (timothy)
 - 7b. Culms not swollen or bulbous at base
 - 8a. Ligules 0.5 to 1.5 mm long, mostly truncate or blunt, sometimes higher at the sides than at the center GROUP VI
 - 8b. Ligules more than 1.5 mm long, sometimes truncate but often obtuse, acute, or acuminate, rarely higher on sides than middle GROUP VII

GROUP I

Ligules a fringe of hairs or a membrane beset with a marginal fringe of hairs, the hairs at least as long as the membrane.

1a. Plants with creeping rhizomes

2a. Culms large, reed-like, over 1 m (40") tall

Culms 2-3 m (6-10') tall, culms hollow; leaf blades flat, 10-30 mm (3/8-1 3/8") broad; plants occur about permanent water courses, ponds and seeps; July-September
..... Phragmites communis (common reed)

2b. Culms less than 1 m (40") tall, not reed-like

3a. Culms rigid and solid, not hollow

Ligules 0.2-0.6 mm long, ciliate, the front of ligule, collar and upper margin of sheath usually pilose, hairs 0.5-3 mm long; blades loosely involute, 2-4 mm broad, upper surface glabrous to pilose-hirsute; culms 10-40 cm (4-16") tall, usually decumbent at base and becoming + stolon-like; sheaths glabrous, closely overlapping vertically; plants of moderately moist to moist, alkaline soils; June-September
..... Distichlis stricta (inland saltgrass)

Ligules 1-3 mm long, long-ciliate, lacerate; blades flat to folded, 1.5-3 mm broad and 2-5 cm (13/16-2") long, involute towards the tip, glabrous to scabrous; culms 15-40 cm (6-16") tall, sometimes decumbent at the base, culm nodes usually puberulent; leaves mostly basal; sheaths glabrous to scabrous, with a few long hairs at the throat; plants of dry, upland soils; May-August
..... Hilaria jamesii (galleta)

3b. Culms hollow

Culms solitary, 3-7 dm (12-28") tall; sheaths smooth to striate; ligule a fringe of hairs + 1 mm long; blades flat, becoming involute with drying, 2.5-5 mm broad at the base, 15-20 cm (6-8") long, scabrous on upper surface and margins, glabrous beneath; plants of moist, usually alkaline soils; June-September
..... Spartina gracilis (alkali cordgrass)

GROUP I (cont'd)

1b. Plants without rhizomes, plants tufted (bunchgrasses)

4a. Culms solid or at least loosely pith-filled

- 5a. Sheaths with only a few spreading hairs at the summit, sometimes nearly glabrous; culm stems terete, pithy; ligules less than 0.5 mm long

Strongly tufted perennial, base of the large clumps with dense collection of old, persisting, cream-colored sheaths; blades strongly involute, 2-4 mm broad, smooth beneath, finely scaberulous above, and sparsely (to copiously) hirsute just above the ligule and along the throat (the longer hairs \pm 3 mm long); the collar glabrous; culms 4-10 dm (16-40") tall; ligules mostly a very short, dense, band of hairs; plant of $\frac{1}{2}$ moist, $\frac{1}{2}$ alkaline soils; June-September
..... Sporobolus airoides (alkali sacaton)

- 5b. Sheaths with a conspicuous tuft of white hairs at the summit; culm stems sulcate, solid; ligules 0.5-0.7 mm long

Tufted perennials, sometimes appearing like annuals; sheaths strongly overlapping, glabrous, with pubescent margins and long pilose tufts at the upper corners of the margins, 2-3 mm long; ligules a short dense line of hairs; blades usually flat, becoming involute with drying, 2-4 mm broad and 5-15 cm (2-6") long, mostly smooth but strongly pilose at margins bordering the ligule; collar with hairs, 2-3 mm long; plants of sandy soils; June-August
..... Sporobolus cryptandrus (sand dropseed)

4b. Culms hollow, not solid or pithy

6a. Leaf blades strongly involute

Culms 4-10 dm (16-40") tall, terete; glabrous; sheaths glabrous or slightly pilose at upper corners of the margins, otherwise smooth; collar glabrous; ligules a very short, dense band of hairs less than 0.5 mm long; blades usually strongly involute (to flat), 2-4 mm broad, smooth beneath, finely scaberulous above and sparsely to copiously hirsute just above the ligule and along the throat (the longer hairs \pm 3 mm long); plants of $\frac{1}{2}$ moist, alkaline soils; June-September
..... Sporobolus airoides (alkali sacaton)

GROUP I (cont'd)

6b. Leaf blades flat to loosely involute

Tufted perennial; culms 3-8 dm (12-32") tall, glabrous, the nodes abruptly contracted; sheaths glabrous to pilose, long-pilose at the throat and often on the collar, the hairs 1-2 mm long; ligules \pm 0.5 mm long, irregularly lacerate and ciliolate or a fringed crown; blades flat to loosely involute, 2-4 mm broad and 10-25 cm (4-10") long, often short-pilose or ciliolate on margins, scaberulous on the surfaces, usually strongly striate; plants of higher precipitation zones (above 14") and mountain meadows; June-August
..... . . . Danthonia californica (California oatgrass)

Low, tufted perennial; culms 1-3 dm (4-12") tall, glabrous, the lower nodes abruptly constricted and readily breaking apart when dry; sheaths usually pilose with hairs from $\frac{1}{2}$ pustular bases; the collar light-yellow in contrast to the bright-green areas above and below; the ligule proper is usually less than 0.5 mm long, but the throat (and sometimes the collar) with dense tuft of nonpustular hairs, 2-4 mm long; blades flat to loosely involute, 1-2 mm broad and 3-8 cm (1 1/4-3 1/8") long, pilose, upper surface usually with hairs more dense than beneath, usually strongly striate; plants of dry meadows or open, rocky slopes; June-August
..... . . . Danthonia unispicata (one-spike oatgrass)

GROUP II

Ligules not a fringe of hairs nor a membrane fringed
with hairs at the margin; sheaths partially to completely
closed from the base upward.

1a. Culms swollen and bulbous at the base

Rhizomatous perennial; culms 25-75 cm (10-30") tall, bulbous at the base, bulbs not attached directly to the rhizome but connected by a slender stem and spaced at intervals of 1-3 cm along the rhizome; sheaths glabrous (scabridulous) to pilose, usually open for 3-10 mm at the top; ligules 1-3 mm long, erose-lacinate, acute to truncate; blades flat, folded or involute, 1-4 mm broad, glabrous to scabrous, at least above; plants of dry to moderately moist meadows and woodlands; June-August
..... Melica spectabilis (purple oniongrass)

Tufted perennial; culm 3-10 dm (12-40") tall, bulbous based, the bulbs closely clustered on short, thick rhizomes, not readily separable; sheaths closed nearly their full length, glabrous (scabridulous) to pubescent; ligules 2-5 mm, often deeply lacinate; blades flat to involute, 2-4 mm broad, glabrous to scabrous; plants of higher precipitation zones (above 14"); late May-August
..... Melica bulbosa (bulbous oniongrass)

1b. Culms not swollen or bulbous at the base

2a. Plants, especially sheaths, pubescent; blades rolled in the bud;
blade tips not boat-shaped

Plants winter annuals with soft, short hairs throughout; culms 1-5 dm (4-20") tall; ligules 1-3 mm long, lacinate-erose; auricles lacking; blades flat, 2-4 mm broad; introduced, weedy; April-June
..... Bromus tectorum (cheatgrass)

Plants tufted perennials, often flowering the first season; culms 6-9 dm (25-35") tall, glabrous to usually pubescent; sheaths pilose, at least at throat; ligules 1-3 mm, erose; auricles, if any, very small; blades flat, 4-9 mm broad, rarely involute, usually pilose sometimes scabrous to glabrous; plants of higher precipitation zones (above 14"); late May-early August
..... Bromus marginatus (mountain brome)

2b. Plants glabrous to scabrous, not pubescent; blades folded in the bud,
the upper leaf surface with two parallel veins down the middle, blade
tips are boat-shaped; auricles lacking

GROUP II (cont'd)

3a. Plants with extensive, creeping rhizomes forming dense sods

Culms 3-7 dm (12-28") tall, slightly compressed, glabrous; sheaths usually glabrous, sometimes \pm scabrous, closed about half their length; ligules shorter than wide, 0.5-1.7 mm long, truncate, mostly entire, ligules of upper culm leaves up to 3 mm long; blades flat or usually folded, 1-3 mm broad, usually with scabrous margins, sometimes purplish near collar; dry to moderately moist meadows, woods; introduced; May-August

..... Poa pratensis (Kentucky bluegrass)

3b. Plants not rhizomatous, densely tufted

4a. Ligules truncate to usually rounded, not acute, 1-2 mm long

Culms 6-13 dm (24-52") tall; leaves many, mostly basal, the basal cluster of leaves 20-40 cm (8-16") high; sheaths smooth to scaberulous, open less than $\frac{1}{2}$ their length; ligules 1-2 mm long; blades 1.5-3.5 mm broad, usually flat becoming involute with drying, usually scabrous only on margins, glaucous; dry to moderately moist soils of higher precipitation zones (above 14"); May-July

..... Poa ampla (big bluegrass)

Culms 3-7 dm (12-28") tall; sheaths smooth, glabrous, open about $\frac{1}{2}$ their length; ligules 1-2 mm long; blades tightly involute, less than 2 mm broad and to 20 cm (8") long, smooth or scabrous, sharp-pointed; plants of moist, alkaline meadows; May-July

..... Poa juncifolia (alkali bluegrass)

4b. Ligules acute, over 2 mm long (at least on culm leaves)

5a. Sheaths closed about half their length

Strongly tufted, usually with large cluster of basal leaves; culms 2-5 dm (8-20") tall, usually producing two short leaves near the base; sheaths often papery, persistent; ligules acute, jagged on margin, 1-3 mm long, those of basal leaves very short and nearly truncate; blades numerous, basal leaves filiform, 0.5-1 mm broad, 10-25 cm (to 10") long, \pm scabrous, the culm leaves with short, somewhat flat blades, 1.5-3 mm broad; plants of upland soils, usually of higher precipitation zones (above 14"); May-July

..... Poa cusickii (Cusick bluegrass)

5b. Sheaths closed less than half their length

GROUP II (cont'd)

- 6a. Sheaths open nearly their full length, closed near the base only

Culms 3-6 dm (12-24") tall, smooth or scabrid; leaves many mostly basal; sheaths closed only at the base, usually scabrous, sometimes smooth, often purplish; ligules acute to acuminate, those of the basal leaves 2-5 mm long, those of culm leaves 3-7 mm long; blades flat or folded, 1-3 mm broad, † scabrous, sometimes on margins only, usually bough on both surfaces, the basal tuft 8-15 cm (to 6") tall; plants of dry, upland soils; April-July
..... Poa scabrella (pine bluegrass)

Culms 2-4 dm (8-16") tall; leaves numerous, mostly basal; plants often more or less completely purple-tinged; culm leaves usually 1, sometimes 2; sheaths glabrous to scabrous, closed only at the base; ligules acute, those of basal leaves mostly less than 1.5 mm and those on the culm leaves usually 1.5-3 mm (up to 5mm) long; blades involute or folded, rarely flat, 0.5-1.5 mm broad and 3-5 cm long, the basal cluster of leaves 3-10 cm (1½-4") high; plants of dry upland soils; April-June Poa secunda (Sandberg bluegrass)

Culms 25-50 cm (10-20") tall; basal leaves erect, usually strongly glaucous, stiff, scabrous, sometimes flat but normally folded or involute on the margins, 1.5-3 mm broad; culm blades reduced or entirely lacking, resulting in the ligule topping a bladeless sheath; ligules variable, 0.5-10 mm long, mostly 3-8 mm long; plants of dry upland soils; May-August
..... Poa fendleriana (muttongrass)

- 6b. Sheaths closed about ¼ their length

Culms 45-80 cm (18-32") tall, often purple-tinged below; foliage green or glaucous, leaves mostly basal forming large rosettes; sheaths smooth, closed about ¼ their length; blades flat or folded, 1-3 mm broad, the basal cluster of leaves 15-30 cm (6-12") high, the very few culm leaves 5-7 cm (2-2 ¾") long; ligules acute or acuminate, those of basal leaves 2-5 mm long, those of culm leaves 3-7 mm long; plants of higher precipitation zones (above 12"); June-August
..... Poa canbyi (Canby bluegrass)

GROUP II (cont'd)

6b. (Cont'd)

Tufted perennial, culms 5-10 dm (20-40") tall; plants leafy throughout but mostly in a basal cluster, 13-25 cm (5-10") high; sheaths glabrous to strongly scabrous, closed little more than $\frac{1}{2}$ their length; ligules acute to acuminate, $\frac{1}{2}$ lacerate, those of the basal leaves 1-1.5 mm long, those of the culms mostly 3-6 mm long; blades flat or folded, sometimes becoming involute with drying, 1-3 mm broad and up to 20-30 cm (8-12") long, glabrous to strongly scabrous; plants relatively moist upland soils and mountain meadows; June-July

..... Poa nevadensis (Nevada bluegrass)

GROUP III

Perennials with open sheaths; ligules membranous;
auricles present on at least some leaves

1a. Plants strongly rhizomatous; ligules less than 1 mm long

2a. Plants forming large clumps

Plants glaucous, sometimes green; culms 3-7 dm (12-28") tall, hollow; sheaths glabrous, scabrous to puberulent, auricles well developed; ligules 0.2-0.7 mm long, truncate, erose-ciliolate; blades usually involute, sometimes flat, 2.5-5 mm broad, scaberulous, sometimes glabrous below; plants of moist river bottoms, meadows; May-August ..
..... Elymus triticoides (creeping wildrye)

Plants green, sometimes glaucous; culms 4-9 dm (16-35") tall; leaves numerous, many cauline; sheaths glabrous to puberulent, auricles well developed, collar of culm blades often purplish; blades flat to loosely involute 1.5-3.5 mm broad, usually pilose on the upper surface; plants rhizomatous due to introgression with A. dasystachyum; plants of dry upland soils; June-early August ..
..... Agropyron spicatum (bluebunch wheatgrass)

2b. Plants do not form large clumps

Strongly rhizomatous, usually glaucous perennial; culms 3-8 dm (12-32") tall; sheaths glabrous to densely pubescent; ligules inconspicuous, less than 0.5 mm long, erose-ciliate; blades flat when fresh, becoming involute with drying, 2-4.5 mm broad, scabrous, sometimes pilose on upper surface; auricles prominent, to 2 mm long, clasping the culm; plants of dry, sandy to heavy textured soils or of moist, saline soils in bottomlands; June-August ..
..... Agropyron smithii (western wheatgrass)

Strongly rhizomatous, usually glaucous perennial; culms 3.5-9 dm (14-35") tall; sheaths glabrous to hirsute, auricles prominent, to 1.5 mm long; ligules inconspicuous, less than 0.5 mm long; erose-ciliolate; blades involute, occasionally flat, 1-3.5 mm broad, usually scaberulous, sometimes pilose on the upper surface; June-August

Plants of dry, usually sandy soils ..
..... Agropyron dasystachyum var. dasystachyum
(thickspike wheatgrass)

Plants of more moist habitats, usually in heavy soils ..
..... Agropyron dasystachyum var. riparium
(streambank wheatgrass)

GROUP III (cont'd)

1b. Plants not rhizomatous

3a. Ligules mostly more than 1.5 mm long

Densely tufted perennial; culms usually more than 7 dm (28") tall and often to 20 dm (6') tall, culms nodes stiffly puberulent, culms hollow; sheaths glabrous to soft hairy; ligules 2-7 mm long, membranous; blades flat, 4.5-15 mm (to ½") wide; auricles prominent (nearly lacking on some leaves); plants of dry uplands to moderately moist bottomlands; June-early August
..... Elymus cinereus (basin wildrye)

Tufted perennial; culms 20-45 cm (8-18") tall, often decumbent; hollow; sheaths glabrous, sides of collar uneven; auricles sometimes lacking or small and blunt to rounded, more obvious on upper leaves; ligules truncate, 1-3 mm long, subentire; blades flat, 4-7 mm broad, scabrous on the margins; plants of mountain meadow habitats; late June-August
..... Phleum alpinum (alpine timothy)

3b. Ligules less than 1.5 mm long

4a. Auricles usually well developed, often more than 1 mm long

Tufted perennial, green to glaucous; culms 8-14 dm (32-55") tall; sheaths glabrous, retrorsely puberulent or pilose, the collar often purple, auricles mostly well developed on at least some leaves, ± 2 mm long and clasping the culm; ligules 0.3-1 mm long, truncate, erose-ciliolate or sometimes entire; blades flat, 4-12 mm broad, mostly scabrous or sparsely pilose, sometimes glabrous below; plants of higher precipitation zones (above 14") and mountain meadows; July-August
..... Elymus glaucus (blue wildrye)

Sheaths and blades hirsute or pilose with spreading to retrorse hairs
..... var. jepsonii

Sheaths and blades glabrous to scabrous
..... var. glaucus

Tufted perennial; culms 4-9 dm (16-35") tall, glabrous or puberulent below the nodes; leaves numerous, many cauline; sheaths commonly glabrous or retrorsely-puberulent, sometimes pubescent, collars often purple, auricles well developed; ligules less than 1 mm long, erose-ciliolate; blades flat to loosely involute, 2-3.5 mm broad, usually glabrous dorsally, pubescent to pilose on ventral surface, rarely pubescent on both surfaces; plants of dry upland soils; June-early August
..... Agropyron spicatum (bluebunch wheatgrass)

GROUP III (cont'd)

4a. (Cont'd)

Tufted perennial with many flowering culms; culms 20-40 cm (8-16") tall, puberulent; sheaths open, puberulent to pilose, sometimes velvety, auricles well developed, 0.5-1.5 mm long; ligules membranous, 0.2-0.7 mm long, subentire; blades flat to involute, 1.5-3.5 mm broad, scabrous to pilose; plant of higher precipitation zones (above 14") on upland soils; late May-June (July)
 Sitanion jubatum (big squirreltail)

4b. Auricles inconspicuous, less than 1 mm long

Tufted perennial; culms 3-7 dm (12-28") tall, soft-pubescent towards base; sheaths copiously soft-pubescent; auricles usually absent, occasionally well developed; ligules 0.2-0.5 mm long, ciliate; blades involute, 2-5 mm broad, 10-20 cm (to 8") long, usually glaucous, dorsal surface glabrous, ventral (upper) surface with short, stiff hairs; plants of dry, upland soils; May-July
 Elymus ambiguus (Colorado wildrye)

Tufted perennial; culms 3-7 dm (12-28") tall; sheaths glabrous to pilose, sometimes velvety, auricles usually absent, when present, less than 0.5 mm long; ligules 0.2-0.6 mm long, truncate, erose to entire, ciliolate; blades flat to involute, 1.5-4 mm broad, scabrous to hirsutulous; plants of moist to wet habitats; weedy; June-August
 Hordeum jubatum (foxtail barley)

Tufted perennial, subglabrous or puberulent to white villous throughout; culms erect to spreading, 10-45 cm (4-18") tall; sheaths open, glabrous to pilose, auricles usually lacking, less than 1 mm long when present; ligules membranous, truncate, ciliolate, less than 0.5 mm long; blades flat, folded or involute, 1-4 mm broad, hirsute to villous, sometimes glabrous below; plants of dry, shadscale deserts to alpine tundra; late May-August
 Sitanion hystrix (bottlebrush squirreltail)

Tufted perennial, rarely producing rhizomes; culms 3-10 dm (12-40") tall; sheaths glabrous or hispid to pilose; auricles inconspicuous, often lacking; ligules less than 0.5 mm long, entire, ciliolate; blades flat, 2-6 mm broad, scabrous to pilose, at least on upper surface; plants of higher precipitation zones (above 14"); June-August
 Agropyron trachycaulum (slender wheatgrass)

..... Agropyron subsecundum (bearded wheatgrass)

GROUP IV

Perennials with open sheaths; ligules membranous;
auricles lacking on all leaves; culms solid

1a. Ligules truncate to rounded, less than 1 mm long

Plants densely tufted; culms 10-25 cm (4-10") tall, solid; leaves in basal clusters, numerous; sheaths usually shiny and smooth; ligules 0.2-0.5 mm long, somewhat higher on sides than at middle, subentire; blades strongly involute-filiform, scarcely 1 mm broad, 5-9 cm (2-3 3/4") long, glabrous to scaberulous below and puberulent above; plants of dry, upland soils; mid-June-August
..... Oryzopsis webberi (Webber ricegrass)

Plants rhizomatous, glaucous (yellowish-green); culms 10-50 cm (4-20") tall, branching at the base, solid; sheaths slightly keeled, glabrous, strongly overlapping each other vertically along the culm, blades abruptly widening immediately above the collar, finely pubescent on the margins; collar yellowish-brown; ligules truncate, less than 1 mm long; blades flat, or folded, 1-2 mm broad, 2-5 cm (3/4-2") long, scabrous, sometimes finely pubescent on upper surface; plants of moist, alkaline soils; July-August
..... Muhlenbergia asperifolia (alkali muhly)

1b. Ligules obtuse to acute, 1-2 mm long

Plants strongly rhizomatous, mat-forming; culms 10-25 cm (4-10") tall, slightly compressed, solid; sheaths glabrous, striate; collar brownish; ligules acute, 1-2 mm long; blades \pm flat, or involute towards the tip or involute throughout, 1-1.5 mm broad, 1-5 cm (to 2") long, puberulent above and scaberulous beneath; plants of moist to moderately moist soils, usually in meadows habitats; July-September
..... Muhlenbergia richardsonis (mat muhly)

GROUP V

Plants rhizomatous perennials or tufted annuals;
sheaths open; ligules membranous; auricles lacking
on all leaves; culms hollow

1a. Culms large, 2-3 m (over 6') tall

Plants with creeping rhizomes; leaf blades flat, 10-30 mm (3/8-1 3/8")
broad; plants occur about permanent water courses, ponds and seeps;
July-September
..... Phragmites communis (common reed)

1b. Culms less than 1.5 m (60") tall

2a. Plants annual

Tufted annual; culms 4-70 cm (2-28") tall, often decumbent at the
base and freely rooting at the nodes thus often appearing perennial;
sheaths smooth to scabrous; ligules 3-10 mm long (depending upon size
of plant), puberulent, acute, lacerate-erose at the tip; blades flat,
3-7 mm broad, glabrous to scabrous; plants of moist habitats, often
in saline/alkaline situations; native to Europe; June-August
..... Polygogon monspeliensis (rabbitfootgrass)

2b. Plants perennial

3a. Ligules more than 1 mm long

Plants with rhizomes or stoloniferous; culms 4-10 dm (16-40")
tall, decumbent; ligules of upper culm leaves 3-6 mm long,
truncate, erose-ciliolate and often lacerate; blades flat,
folded or involute, 2-5 mm broad; plants of moist habitats;
native to Europe; mid-June-early September
..... Agrostis alba (redtop)

3b. Ligules less than 1 mm long

Plants rhizomatous, glaucous (yellowish-green); culms 10-50 cm
(4-20") tall, branching at the base, hollow; sheaths slightly
keeled, strongly overlapping each other vertically; blades
abruptly widening immediately above the collar, finely pubescent
on the margins; collar yellowish-brown; ligules truncate, less
than 1 mm long; blades flat, or folded, 1-2 mm broad, 2-5 cm
(3/4-2") long, scabrous, sometimes finely pubescent on the upper
surface; plants of moist, alkaline soils; July-August
..... Muhlenbergia asperifolia (alkali muhly)

GROUP VI

Plants tufted, not rhizomatous; culms hollow; auricles lacking; sheaths open; ligules membranous, less than 2 mm long, often higher on the sides than at the center, mostly truncate or blunt

1a. Ligules rounded at the top (obtus), more than 1 mm long

2a. Blades less than 3 mm broad, involute to filiform

Tufted perennial; culms 15-40 cm (6-16") tall; sheaths overlapping vertically; ligules 1-2 mm long, obtuse, erose-lacerate; blades filiform, involuted, mostly basal, 4-10 cm (2-4") long and less than 0.5 mm as rolled, $\frac{1}{2}$ glaucous; plants of alkaline meadows and flats; June-July
..... Puccinellia lemmonii (Lemmon alkaligrass)

Tufted perennial; culms 4-8 dm (16-32") tall; ligules 1-3 mm long; sheaths overlapping vertically; blades 1-3 mm broad, often involute; plants of moist, alkaline soils; late May-early August
..... Puccinellia airoides (Nuttal alkaligrass)

2b. Blades mostly 4-8 mm broad, flat

Tufted perennial; culm 5-10 dm (20-40") tall, usually enlarged and $\frac{1}{2}$ bulbous at the base; sheaths glabrous; ligules 2-3 mm long, subentire although sometimes lacerate; blades flat, 3-8 mm broad, scabrous margined, sometimes with a tiny auricle where freed from the sheath; plants of moist meadows; native of Europe; late June-Sept. ...
..... Phleum pratense (timothy)

1b. Ligules squared or cut-off at top (truncate), mostly less than 1 mm long (except Hesperochloa)

3a. Leaves slightly to strongly puberulent or pubescent, hairs sometimes confined to throat or collar but usually occur on sheath and blade as well

4a. Blades flat

Tufted perennial; culms 3-7 dm (12-28") tall; sheaths glabrous to pubescent; ligules about 0.5 mm long, erose, ciliate; blades flat, 2-5 mm broad, scabrous to pilose, at least above, auricles lacking; plants of moist meadow habitats; June-August
..... Hordeum brachyantherum (meadow barley)

GROUP VI (cont'd)

4b. Blades involute, rarely flat

Tufted perennial; culms 3-7 dm (12-28") tall, soft-pubescent toward base; leaves mostly basal; sheaths commonly pubescent, sometimes glabrous; auricles usually lacking, sometimes prominent; ligules 0.2-0.5 mm long, ciliate; blades involute, rarely flat, 2-5 mm broad, 5-20 cm (2-8") long, usually hirsute to pilose on upper surface, generally glabrous beneath; plants of dry, sagebrush slopes; late May-July
..... Elymus ambiguus (Colorado wildrye)

Tufted perennial; culms 25-40 cm (10-16") tall, glabrous, often with short, stiff bristles or bristle-like hairs at the nodes; sheaths glabrous to hirsute; ligules 0.2-0.7 mm long, entire to slightly erose-ciliolate, sometimes flanked by tufts of hairs that extend down the margins of the sheath; blades filiform-involute, rarely flat, 1-2 mm broad and 10-30 cm (4-12") long, puberulent; plants of higher precipitation zones (above 12") on dry to moderately moist sagebrush slopes; June-August
..... Stipa occidentalis (western needlegrass)

Tufted perennial; culms 2-7 dm (8-28") tall; glabrous with very short, soft hairs below the nodes; sheaths glabrous to slightly scabrous, the throat usually glabrous; ligules 0.2-0.7 mm long, erose-ciliolate; blades involute or flat, 1-3 mm broad, often involute towards the tip, 10-25 cm (4-10") long, pubescent above, glabrous below; plants of higher precipitation zones (above 12"); June-August
..... Stipa nevadensis (Nevada needlegrass)

Tufted perennial; culms 4-10 dm (16-40") tall; sheaths glabrous to densely pubescent, strongly ribbed; ligules 0.2-1 mm long; blades involute, sometimes flat, 2-5 mm broad, 10-20 cm (4-8") long, glabrous to pubescent, often strongly striate; plants of higher precipitation zones (above 14"); June-September
..... Stipa columbiana (Columbia needlegrass)

Tufted perennial; culms 3.5-6.5 dm (14-26") tall; sheaths striate, shiny, upper glabrous, lower most pilose; ligules less than 0.5 mm long, densely ciliolate, a tuft of hairs on each side of the throat, the hairs 0.2-0.8 mm long; blades tightly involute, less than 1 mm broad, 20-40 cm (8-16") long, glabrous on exposed surface with scaberulous margins; dry, rocky or sandy soils, south of 40° N. latitude; (April) May-June
..... Stipa speciosa (desert needlegrass)

GROUP VI (cont'd)

3b. Leaves glabrous or scabrous to minutely puberulent

5a. Blades flat, not tightly involute

6a. Ligules either uniform in length or higher at the middle

Plants rhizomatous, often forming ring-like tufts up to 2 m (6') in diameter; culms 3-10 dm (12-40") tall; sheaths smooth, striate; ligules thin, dry, 1-3 mm long, erose-ciliolate; blades erect, flat, 2-4 mm broad and 20-40 cm (8-16") long, glaucous, coarsely striate; plants of sagebrush slopes and ridges of higher precipitation zones (above 14"); June-August
..... Hesperochloa kingii (spike fescue)

Tufted perennial; culms 3-7 dm (12-28") tall; sheaths glabrous to pubescent; ligules about 0.5 mm long, erose, ciliolate; blades flat, 2-5 mm broad, scabrous to pilose, at least above, auricles lacking; plants of moist meadow habitats; June-August
..... Hordeum brachyantherum (meadow barley)

6b. Ligules longer on the sides than at the middle

Tufted perennial; culms 4-10 dm (16-40") tall; sheaths glabrous to densely pubescent, strongly ribbed; ligules 0.2-1 mm long, truncate, usually longest on the sides; blades flat, sometimes involute, 2-5 mm broad, 10-20 cm (4-8") long, glabrous or slightly scaberulous to densely pubescent, often strongly striate; plants of higher precipitation zones (above 14"); June-September
..... Stipa columbiana (Columbia needlegrass)

5b. Blades involute to filiform

7a. Ligules entire to erose, without a marginal fringe of hairs

Tufted perennial; culms 4-10 dm (16-40") tall; sheaths glabrous to densely pubescent, strongly ribbed; ligules 0.2-1 mm long, truncate, usually longest on the sides; blades involute, sometimes flat, 2-5 mm broad, 10-20 cm (4-8") long, glabrous to pubescent, often strongly striate; plants of higher precipitation zones (above 14"); June-September
..... Stipa columbiana (Columbia needlegrass)

GROUP VI (cont'd)

7a. (Cont'd)

Tufted perennial; culms 25-40 cm (10-16") tall, glabrous to hispidulous, especially at the nodes; sheaths glabrous to hirsute; ligules 0.2-0.7 mm long, truncate, often higher on the sides than at the middle, entire to erose-ciliate, sometimes flanked by tufts of hairs extending down sheath margins; blades filiform-involute, rarely flat, 1-2 mm broad and 10-30 cm (4-12") long, puberulent; plants of higher precipitation zones (above 14"); June-August
..... Stipa occidentalis (western needlegrass)

Tufted perennial; culms 25-60 cm (10-24") tall, glabrous or minutely scaberulous; sheaths glabrous, sometime scaberulous; ligules 0.2-1.2 mm long, truncate; blades involute, filiform, rarely flat, to 2 mm broad, 10-20 cm (4-8") long, hispid above, glabrous to minutely scaberulous below; plants of higher precipitation zones (above 14"); July-September .
..... Stipa lettermanii (Letterman needlegrass)

7b. Ligules beset with a marginal fringe of minute hairs

Tufted perennials; culms 4-7 dm (16-28") tall; leaves mostly basal, the basal tuft of leaves 15-25 cm (6-10") high; sheaths glabrous to scabrous; ligules about 0.5 mm long, ciliate, higher on sides than in the center; blades filiform folded-involute, less than 1 mm broad, auricles lacking; dry slopes of higher precipitation zones (above 12"); May-August
..... Festuca Idahoensis (Idaho fescue)

GROUP VII

Plants tufted; culms hollow; auricles lacking;
sheaths open; ligules membranous, more than 2 mm
long, rarely higher on sides than at the middle

- 1a. Blades of basal leaves filiform to strongly involute, less than 1 mm broad when flattened; culm blades less than 1 mm broad when folded

- 2a. Ligules less than 3 mm long

Tufted perennial; culms 15-40 cm (6-16") tall; leaves mostly basal; sheaths overlapping vertically; ligules obtuse, slightly erose-lacerate, usually 1-2 mm long; blades strongly involute, filiform, less than 0.5 mm broad as rolled, 4-10 cm (2-4") long, upper cauline leaf greatly reduced; plants of moist alkaline habitats; June-July Puccinellia lemmonii (Lemmon alkaligrass)

- 2b. Ligules more than 3 mm long

- 3a. Plants of moist, shady slopes, seeps and meadows

Tufted perennial; herbage glabrous below the inflorescence; culms 2-8 dm (8-32") tall; sheaths glabrous to scabrous; ligules 3-8 mm long, acuminate, often lacerate; blades flat or folded, 1-3 mm broad and 2-4 cm (3/4-1 1/2") long, often scabrous on upper surface; cauline leaves sometimes to 5 mm broad; late June-August Deschampsia elongata (slender hairgrass)

- 3b. Plants of dry, sandy or rocky soils

- 4a. Blades scabrous on underside (dorsally)

Tufted perennial; culms 3.5-5.5 dm (14-22") tall, puberulent at the nodes; sheaths glabrous, striate; ligules 2-5 mm long, acute, sometimes truncate; lacerate at tip; blades filiform-involute, 1-2 mm broad and 10-25 cm (4-10") long; late May-June Stipa thurberiana (Thurber needlegrass)

- 4b. Blades smooth on underside (dorsally)

Tufted perennial; culms 3-8 dm (12-32") tall, glabrous, often puberulent at the nodes; sheaths smooth to scabrous, strongly ribbed; ligules 1-5 mm long, acute becoming lacerate; blades involute, 1-3 mm broad and 10-30 cm (4-12") long, smooth to minutely scabrous beneath, scabrous on the upper surface; May-July Stipa comata (needleandthread)

GROUP VII (cont'd)

4b. (Cont'd)

Tufted perennial; 3-6 dm (12-24") tall; sheaths glabrous to puberulent, often partly buried in sandy soils, throat usually ciliate; ligules 4-8 mm long, acuminate, entire, becoming lacerate; blades strongly involute, usually smooth, about 1 mm broad, nearly as long as the culms; May-July ...
..... Oryzopsis hymenoides (Indian ricegrass)

1b. Blades of basal leaves flat to strongly involute, at least 1 mm broad; culm blades more than 1.5 mm broad even when folded

5a. Blades of basal leaves 1.5-3 mm broad

6a. Plant of alkaline, moist habitats

Tufted perennial; culms 4-8 dm (16-32") tall; ligules obtuse, 1-3 mm long; blades 1-3 mm broad, often involute; late may-early August
..... Puccinellia airoides (Nuttall alkaligrass)

6b. Plants of non-alkaline, moist habitats

Tufted perennial; herbage glabrous below the inflorescence; culms 1-6 dm (4-24") tall; sheaths glabrous; ligules 3-8 mm long, acuminate, often lacerate; blades flat or folded, basal leaves about 1 mm broad, culm leaves up to 5 mm broad, blades 2-4 cm (3/4-1 1/2") long, often scabrous on upper surface; late June-August
..... Deschampsia elongata (slender hairgrass)

Tufted perennial; culms 2-8 dm (8-32") tall; sheaths glabrous to scabrous; ligules 3-8 mm long, acuminate, often lacerate; pubescent; blades flat or folded, 1-3 mm broad, scabrous on upper surface, glabrous to scabrous beneath, blades with only a few, prominent, raised veins; plants of mountain meadows; late July-September
..... Deschampsia cespitosa (tufted hairgrass)

5b. Blades of basal leaves more than 3 mm broad

Rhizomatous perennial; culms 3-10 dm (12-40") tall; sheaths smooth, striate; ligules 1-3.5 mm long, erose-ciliolate; blades flat to involute, 3-6 mm broad and 20-40 cm (8-16") long, glaucous, coarsely striate; plants of higher precipitation zones (above 14"); June-August
..... Hesperochloa kingii (spike fescue)

Tufted perennial; culms 2-5 dm (8-20"), often decumbent; sheaths glabrous; ligules 0.5-3 mm long, truncate; blades flat, 3-7 mm broad, scabrous on the margins; auricles normally lacking or occasionally on upper leaves; plants of mountain meadows; late June-August
..... Phleum alpinum (alpine timothy)



KEY TO TRIBES

- 1a. Spikelets with the glumes persistent, disarticulation above the glumes, 1-to many-flowered; rachilla often prolonged beyond the upper lemma.
- 2a. Spikelets borne in an open or spike-like raceme or panicle, usually upon distinct pedicels.
- 3a. Spikelets 1-flowered. AGROSTIDEAE
- 3b. Spikelets 2-to-many-flowered.
- 4a. Glumes usually longer than the lemma; the awn dorsal and usually bent. AVENEAE
- 4b. Glumes usually shorter than lemma; the awn terminal and straight or awnless. FESTUCEAE
- 2b. Spikelets sessile on opposite sides of a jointed or continuous axis; spike terminal, solitary. HORDEAE
- 1b. Spikelets falling entire, the glumes not persistent, disarticulation below the glumes, 1-flowered; rachilla not extending beyond upper lemma.
- 5a. Inflorescence a dense spike with clusters of three spikelets at each node of a zig-zag rachis Hilaria
(TRIBE: ZOYSIEAE)
- 5b. Inflorescence an open, contracted, or spike-like panicle, but not a true spike.
- 6a. Lemma and palea hyaline, thin, more delicate in texture than the glumes. AGROSTIDEAE
- 6b. Lemma and palea firm not hyaline, similar in texture to the glumes. Spartina
(TRIBE: CHLORIDEAE)

Tribe: AVENEAE

- 1a. Lemmas awned from a bifid apex, awn arising between the lobes, awns
5-12 mm long, flat, bent Danthonia
- 1b. Lemmas awned from the back, awn attached below the middle; rachilla
prolonged beyond the upper floret Deschampsia

Tribe: CHLORIDEAE

- Only one genus recognized in this tribe for purposes of this key
. . . . Spartina

Tribe: FESTUCEAE

- 1a. Plants tall, stout reeds over 2 m (6') tall; panicles large, plume-like;
rachilla with long silky hairs Phragmites
- 1b. Plants not reed-like, less than 1.5 m (5') tall
- 2a. Plants dioecious, perennial
- 3a. Plants densely tufted, erect from short rhizomes; lemmas
scabrous; grasses of dry mountain slopes Hesperochloa
- 3b. Plants not densely tufted, spreading by creeping rhizomes;
lemmas glabrous; grasses of saline/alkali habitats Distichlis
- 2b. Plants not dioecious
- 4a. Lemmas keeled on the back (sometimes rounded in Poa)
- 5a. Lemmas awned from a minutely bifid apex; spikelets
large Bromus
- 5b. Lemmas awnless; spikelets small Poa
- 4b. Lemmas rounded on the back (slightly keeled toward the
summit in Bromus and Festuca)
- 6a. Glumes papery; lemmas firm, strongly nerved, scarious-
margined; upper florets sterile and represented by empty
lemmas in a compact cluster; spikelets tawny or purplish
. . . . Melica

6b. Glumes not papery; upper florets like the others

7a. Nerves of lemma converging toward the summit,
lemmas narrowed at apex

8a. Lemmas awned or awn-tipped from a minutely
bifid apex; palea adhering to the caryopsis

. . . . Bromus

8b. Lemmas entire, pointed, awnless or awned
from the tip

9a. Spikelets awned; lemmas pointed

. . . . Festuca

9b. Spikelets awnless

. . . . Poa

7b. Nerves of lemma parallel, not converging at the
summit

. . . . Puccinellia

Tribe: HORDEAE

1a. Spikelets solitary at each node of the rachis (rarely 2 in some species,
but not throughout); spikelets placed flat-wise to rachis, several-
flowered

. . . . Agropyron

1b. Spikelets normally more than 1 at each node of rachis

2a. Spikelets 3 at each rachis node, 1-flowered, the lateral pair
pedicelled, usually reduced to awns

. . . . Hordeum

2b. Spikelets 2 or more (sometimes 1 in Elymus) at each node of
the rachis, alike, 2- to 6-flowered

3a. Rachis continuous; glumes entire, not greatly elongate

. . . . Elymus

3b. Rachis disarticulating at maturity; glumes bristle-
like and greatly elongate

. . . . Sitanion

Tribe: ZOYSIEAE

Only one genus recognized in this tribe for purposes of this key

. . . . Hilaria

AGROPYRON

- 1a. Plants strongly rhizomatous, with long creeping rhizomes
- 2a. Glumes rigid, hard or tough in texture, nerves inconspicuous,
tapering from below the middle into an awn tip A. smithii
- 2b. Glumes not rigid, thin, strongly nerved, broadest at or above
the middle
- 3a. Lemmas glabrous A. dasystachyum var. riparium
- 3b. Lemmas pubescent A. dasystachyum var. dasystachyum
- 1b. Plants typically without creeping rhizomes, occasionally with short
rhizomes present
- 4a. Lemmas with awns 10 to 30 mm long
- 5a. Awns of lemmas curving outward at maturity; glumes no more
than half as long as the spikelet; spikelets usually shorter
than the internodes of the spike A. spicatum
- 5b. Awns of lemmas straight, not curving outward; glumes 2/3 to
nearly as long as the spikelet; spikelets overlapping, longer
than the internodes of the spike
..... A. subecundum (A. trachycaulum)
- 4b. Lemmas awnless or with awn 1-4 mm long; glumes 2/3 to nearly as
long as spikelet; spikelets scarcely overlapping
..... A. trachycaulum var. trachycaulum

AGROSTIS

One species considered in this key.

Plants perennial; palea evident; glumes scabrous on the keel only;
panicles open, sometimes closing after anthesis; branches of panicle
bearing spikelets from the base; ligule 3-6 mm long
..... Agrostis alba

BROMUS

- 1a. Plants annual, introduced, weedy; panicles with drooping branches; spikelets somewhat flattened, 1-2 cm long; awns straight, 10-17 mm long B. tectorum
- 1b. Plants perennial, native
- Spikelets strongly flattened; lemmas usually carinate-keeled; awns 4-8 mm long; plants mostly pubescent throughout Bromus marginatus

DANTHONIA

- 1a. Spikelets 3-5, borne on widely spreading or reflexed pedicels; lobes of lemma aristate, the lobes 3-5.5 mm long; plants typically over 5 dm (20") tall D. californica
- 1b. Spikelets usually 1; lobes of the lemma acuminate, not aristate, the lobes 1-3.5 mm long; plants typically less than 3 dm (12") tall D. unispicata

DESCHAMPSIA

- 1a. Panicle open or contracted, if contracted, not more than 1/4 the length of the culm; blades flat or folded 1-3 mm broad; glumes shorter than upper floret D. cespitosa
- 1b. Panicle narrow, elongate, $\frac{1}{3}$ the length of the culm; blades usually filiform, basal leaves about 1 mm broad; glumes usually equalling or exceeding the upper floret D. elongata

DISTICHLIS

Only one species in Nevada.

Low dioecious perennials with strong creeping or deeply running rhizomes; blades 1-2 dm (4-8") long, equally spaced on the culm; spikelets 4-6 mm broad D. stricta

ELYMUS

- 1a. Plants with creeping rhizomes; lemmas glabrous or scabrous. awnless or with a short awn 0.5-2.5 mm long; glumes 7-11 mm long; spikelets usually paired at a rachis node, sometimes solitary; plants of moist bottomlands E. triticoides

ELYMUS (cont'd)

- 1b. Plants without rhizomes, or if present (E. cinereus) short and the plants forming clumps and appearing as bunchgrasses
- 2a. Ligules more than 2 mm long; blades flat 5-15 mm broad; culms mostly more than 1 m (3') tall E. cinereus
- 2b. Ligules less than 1 mm long; blades either involute or less than 5 mm broad
- 3a. Glumes broadly lanceolate, broadest above the base, the nerves evident, awn-tipped; lemmas awned, the awn 1-2 times the lemma body length, awns straight E. glaucus
- 3b. Glumes narrower, subulate, not broadened above the base, nerves obscure; lemmas tapering to a short awn 0.5-1.5 mm long E. ambiguus

FESTUCA

Only one species considered in this key.

Plants tufted perennials; blades filiform, folded-involute, less than 1 mm broad; ligules less than 1 mm long, scabrous; panicles open, 7-12 cm (3-5") long; spikelets 5- to 7-flowered F. idahoensis

HESPEROCHLOA

Only one species present in Nevada.

Plants tufted, rhizomatous perennials; blades flat, 3-6 mm broad, to 3 dm (12") long; ligules 1-4 mm long; panicle congested, 3-15 cm (1-6") long with short appressed branches H. kingii

HILARIA

Only one species considered in this key.

Plants rhizomatous perennials; culms and leaves glabrous to hirsutulous, not pubescent; culms 1.5 to 4 dm (6-16") tall H. jamesii

HORDEUM

- 1a. Glumes with awns 25-150 mm (to 6") long; awns of lemmas 10-60 mm long H. jubatum
- 1b. Glumes with awns 7-20 mm long; awns of lemmas 5-10 mm long H. brachyantherum

MELICA

- 1a. Bulb at base of culm attached to the rhizome by a slender stem; the first glume less than half as long as the spikelet, glume 4-6 mm long M. spectabilis
- 1b. Bulb at base of culm attached directly to the rhizome; first glume more than half as long as spikelet; glume 6-8 mm long M. bulbosa

MUHLENBERGIA

- 1a. Panicles narrow, the spikelets on short pedicels; blades usually involute; lemma about twice as long as the glumes M. richardsonis
- 1b. Panicle open when fully extended from sheath, the spikelets on slender, elongate pedicels; blades flat or folded; lemma only slightly longer than the glume M. asperifolia

ORYZOPSIS

- 1a. Panicles 8-35 cm (3-14") long; ligules 1-8 mm long; awn of lemma 3-6 mm long O. hymenoides
- 1b. Panicles short, 3-6 cm (1-2½") long; ligules 0.2-0.5 mm long; awn of lemma 5-7 mm long O. webberi

PHLEUM

- 1a. Panicle cylindric, several times longer than wide; culms usually more than 5 dm (20") tall, erect from a swollen, bulb-like base P. pratense
- 1b. Panicle ovoid or oblong, usually no more than twice as long as wide; culms usually less than 5 dm (20") tall with a somewhat decumbent, creeping, non bulb-like base P. alpinum

PHRAGMITES

Only one species in Nevada.

Plants tall, stout to 3 m (10') tall; panicle plume-like; blades flat 10-30 mm broad P. communis

POA

1a. Plants with creeping rhizomes present

Culms terete; lemmas pubescent on the keel, with copious cobwebby hairs at the base; lower panicle branches in 4s or 5s P. pratense

1b. Plants without creeping rhizomes

2a. Spikelets strongly compressed; glumes and lemmas keeled

3a. Lemmas pubescent on keel and marginal nerves; plants 25-75 cm (10-30") tall; panicles 5-15 cm (2-6") long; spikelets mostly pistillate P. fendleriana

3b. Lemmas glabrous to scaberulous; plants more than 25 cm (10") tall; blades usually filiform, less than 1 mm broad, scabrous ..
..... P. cusickii

2b. Spikelets little compressed, narrow; lemmas rounded on the back, the keel obscure

4a. Lemmas crisp-puberulent toward base

5a. Spring-flowering, summer dormant

6a. Plants relatively small, mostly less than 3 dm (12") tall; basal leaves forming a low, dense tuft, 3-10 cm (1-4") high; panicles 2-7 cm (to 2 3/4") long
..... P. secunda

6b. Plants larger, mostly more than 3 dm (12") tall; basal leaves looser, the tuft 3-15 cm (1-6") high; panicles 4-12 cm (to 5") long P. scabrella

5b. Plants summer-flowering and summer active

Basal tuft of leaves 15-30 cm (6-12") high; panicles 9-16 cm (to 6") long P. canbyi

4b. Lemmas glabrous or scabrid, not puberulent on lower part

7a. Ligule decurrent, 2-7 mm long, acuminate or sharply acute .
..... P. nevadensis

7b. Ligule not obviously decurrent, 1-2 mm long, rounded or obtuse to truncate

8a. Blades involute, greenish, mostly less than 1.5 mm broad; culms 2-7 dm (8-28") tall, alkaline habitats ..
..... P. juncifolia

POA (cont'd)

- 8b. Blades flat, glaucous, 1.5-3.5 mm broad; culms 6-18 dm (2-6') tall; non-alkaline habitats P. ampla

POLYPOGON

Only one species considered in this key.

Plants tufted annuals; glumes bilobed, the awns 5-10 mm long; moist habitats P. monspeliensis

PUCCINELLIA

- 1a. Blades well distributed along the stem, usually over 1 mm broad (at least more than 0.5 mm broad)
- Panicle open, lower branches erect or spreading, not reflexed, the panicles 10-25 cm (to 10") long; lemmas narrowed into an obtuse apex, \pm 3 mm long P. airoides
- 1b. Blades mostly in a short basal tuft, filiform (scarcely 0.5 mm broad); panicle 5-10 cm (to 4") long P. lemmonii

SITANION

- 1a. Glumes cleft into 3-to many fine divisions; auricles mostly apparent, some \pm 1 mm long S. jubatum
- 1b. Glumes entire or 2-cleft, rarely 3-cleft with 2 short lateral awns; auricles inconspicuous S. hystrix
- 2a. Spikelets usually 2 at each node of the rachis, if more then some florets of the lateral spikelets fertile
- 3a. Lower most floret of one or both spikelets at each node sterile and reduced to a glume-like structure
- 4a. Glumes tending to be 2-cleft, at least one of the glumes at each node; awns of the glumes longer than awns of lemmas; lowlands S. hystrix var. hystrix
- 4b. Glumes entire; awns of lemma longer than awns of glumes; mid to high elevations S. hystrix var. californicum
- 3b. Lower most floret fertile, not at all reduced; deserts to alpine habitats S. hystrix var. brevifolium
- 2b. Spikelets 3 at each node of the rachis, florets of central spikelet fertile, those of lateral spikelets rudimentary; lowlands S. hystrix var. hordeoides

SPARTINA

Only one species considered in this key.

Plants perennial with creeping rhizomes; second glume 7-10 mm long, awnless or merely mucronate, and barely exceeding the lemma; spikes 2-5 cm long, distinct, appressed; alkaline meadow habitats S. gracilis

SPOROBOLUS

- 1a. Sheaths with only a tuft of hairs at throat; panicle branches with spikelets borne chiefly near the tips; spikelets usually falling entire; glumes glabrous; alkaline bottomland habitats S. airoides
- 1b. Sheaths with a conspicuous tuft of white hairs at the summit; panicle branches usually spikelet-bearing nearly to the base; panicle open, often partially included in the sheath; empty glumes usually left on inflorescence; glumes scabrous on keel; dry, sandy habitats S. cryptandrus

STIPA

- 1a. Awns pubescent, commonly plumose
- 2a. First segment of the once-geniculate awn strongly plumose, the hairs 5-8 mm long S. speciosa
- 2b. First segment of the awn conspicuously pubescent, the hairs not more than 2 mm long
- 3a. Ligules hyaline, 3-6 mm long; glumes often purple S. thurberiana
- 3b. Ligules opaque, 0.2-0.7 (2) mm long; glumes often greenish
- 4a. Pubescence of lemma tip and first awn segment similar, the hairs subequal in length; palea less than half as long as lemma S. occidentalis
- 4b. Pubescence of the lemma tip and first awn segment dissimilar, the hairs of the lemma longer; palea mostly more than half as long as lemma S. nevadensis
- 1b. Awns scabrous to subglabrous, rarely appressed-hispid, not plumose
- 5a. Lemma 10-14 mm long; awn 70-160 mm (to 6") long; panicle 18-40 cm (7-16") long; glumes 15-35 mm long S. comata

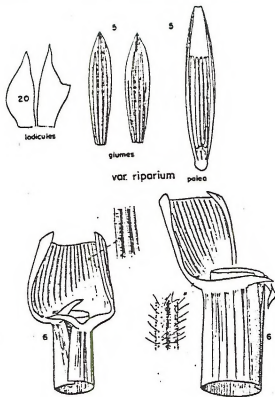
STIPA (cont'd)

- 5b. Lemma 4-8 mm long; awn 10-50 mm long; panicle 7-25 cm (2 3/4-10") long; glumes 5-15 mm long, narrow, gradually acuminate; hairs on the lemma less than 1.5 mm at the summit.
- 6a. Awn 20-50 mm long; lemma 5.5-7.2 mm long; palea less than half as long as lemma, palea not more than 2.5 mm long
..... S. columbiana
- 6b. Awn 10-22 mm long; lemma 4.5-5.7 mm long; palea about 3.5 mm long, palea more than half as long as lemma; hairs at summit of lemma longer than those of the body S. lettermanii

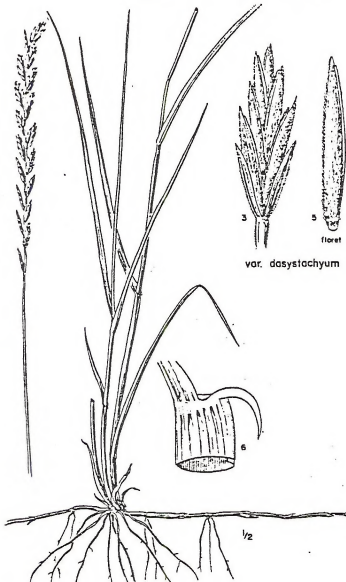
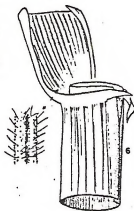
Agropyron dasystachyum

THICKSPIKE WHEATGRASS

Strongly rhizomatous, usually glaucous perennial; culms 3.5-9 dm (14-35") tall, hollow; sheaths open, glabrous to hirsute; ligules membranous, about 0.5 mm long, eroseciliate; blades firm, stiff, 2-4 mm broad, flat to involute, glabrous to scaberulous, sometimes pilose, beneath, usually scaberulous (to pilose) on the upper surface; auricles prominent, up to 1.5 mm long; inflorescence a bilateral spike with solitary spikelets (sometimes 2 at a node) alternating on 2 sides of a continuous rachis, the spikelets borne flatwise to the rachis; spikes 6-22 cm (2-9"), stiff, slender, erect, the rachis internodes 7-12.5 mm long in the middle of the spike; spikelets laterally compressed, with disarticulation above the glumes, 11-18 mm long, 3- to 6-flowered; glumes oblong-lanceolate, broadest at or slightly above midlength, then abruptly narrowed and acute to acuminate or awn-tipped, pubescent (rarely glabrous), usually shorter than the first lemma, first glume 4-8.5 mm long, second glume 5.5-10 mm long, inconspicuously 3- to 5-nerved; lemmas 7-10 mm long, pubescent (rarely glabrous), acute, sometimes awn-tipped; paleas subequal to lemmas; anthers about 4 mm long; lodicules lanceolate, sometimes lobed, about 1 mm long; June-August.



var. riparium

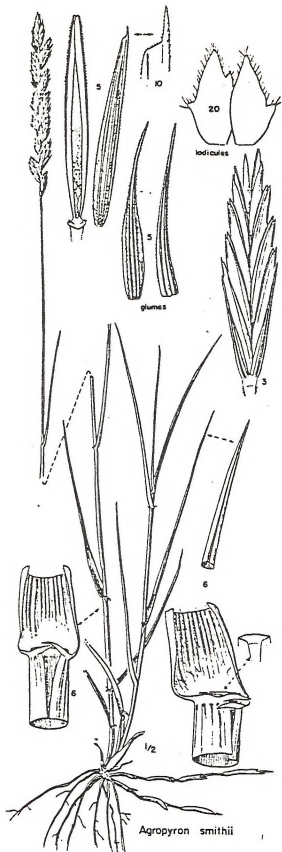


var. dasystachyum

1. Lemmas scabrous to villous; plants of dry, usually sandy soils
..... A. dasystachyum var. dasystachyum
THICKSPIKE WHEATGRASS
1. Lemmas glabrous to scaberulous; plants of more moist habitats, usually in heavy soils
..... A. dasystachyum var. riparium
STREAMBANK WHEATGRASS

Agropyron smithii

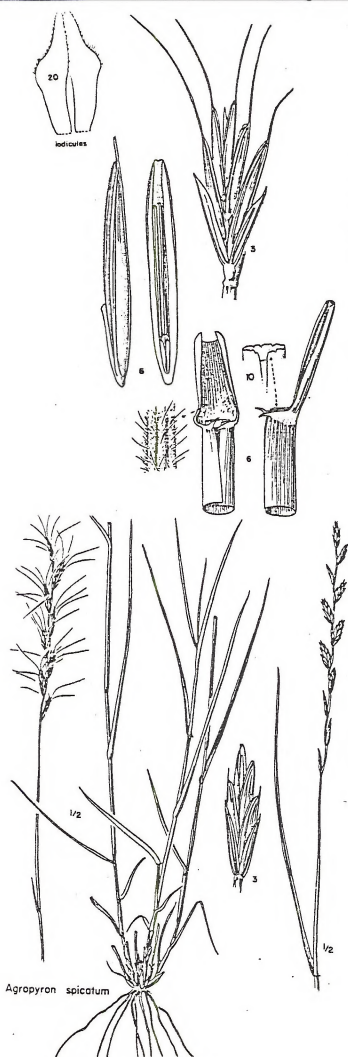
WESTERN WHEATGRASS



Strongly rhizomatous, usually glaucous perennial; culms 3-8 dm (12-32") tall, hollow; sheaths open, glabrous to densely pubescent; ligules membranous, about 0.5 mm long, erose-ciliate; blades stiff, flat when fresh, becoming involute with drying, 2-5 mm broad, scabrous and sometimes pilose on the upper surface; auricles prominent, to 2 mm long and clasping the culm; inflorescence a bilateral spike with solitary spikelets (sometimes 2 per node) alternating on 2 sides of a continuous rachis, the spikelets borne flatwise to the rachis; spikes 5.5-15 cm (2-6") long, stiff, erect, the rachis scabrous on the angles, rachis internodes 5.5-10 mm long in the middle of the spike, spikelets closely overlapping vertically along the rachis; spikelets laterally compressed, disarticulation above the glumes; spikelets 12-24 mm long, 4- to 8-flowered; glumes rigid, linear-lanceolate to lanceolate, gradually tapering from below the middle and acuminate or awn-tipped, asymmetrical, 3- to 5-nerved, glabrous to scabrous on the nerves, the first glume 7-9 mm long, the second 9-10 mm long often equaling the first lemma; lemmas 8-11 mm long, acute, glabrous to pubescent, awn-tipped or with awn to 5 mm long; paleas subequal to lemmas; anthers about 3 mm long; lodicules ovate, often lobed, more than 1 mm long; plants of sandy to heavy textured soils, often in moist, saline/alkaline habitats; June-August.

Agropyron spicatum
BLUEBUNCH WHEATGRASS

Tufted perennials, sometimes with rhizomes due to introgression with A. dasystachyum, green or glaucous; culms 4-9 dm (16-35") tall, hollow, glabrous or puberulent below the nodes; leaves mostly cauline, sheaths open, glabrous to puberulent; ligules membranous, less than 1 mm long, erose-ciliolate; blades flat to loosely involute 2-4 mm broad, usually pilose on the upper surface, rarely pubescent on both surfaces; auricles well developed; inflorescence a bilateral spike with solitary spikelets alternating on 2 sides of a continuous rachis, the spikelets borne flatwise to the rachis; spikes 8-16 cm (3-6") long, slender, loose, open, rachis internodes 9-17 mm long in the middle of the spike, scabrous on the angles; spikelets laterally compressed, disarticulation above the glumes; spikelets 12-16 mm long, 4- to 6-flowered; glumes narrowly oblong to obovate, rounded to acute, awnless or rarely awn-tipped, 4- to 5-nerved, the margins scariou, glabrous or scabrous on the nerves, about half the length of the spikelet; lemmas 8-10 mm long, glabrous, 5-nerved, awnless to typically awned with divergent awns 9-15 mm long; lodicules lanceolate, about 1.5 mm long; anthers 4-6 mm long, purplish; June-early August.

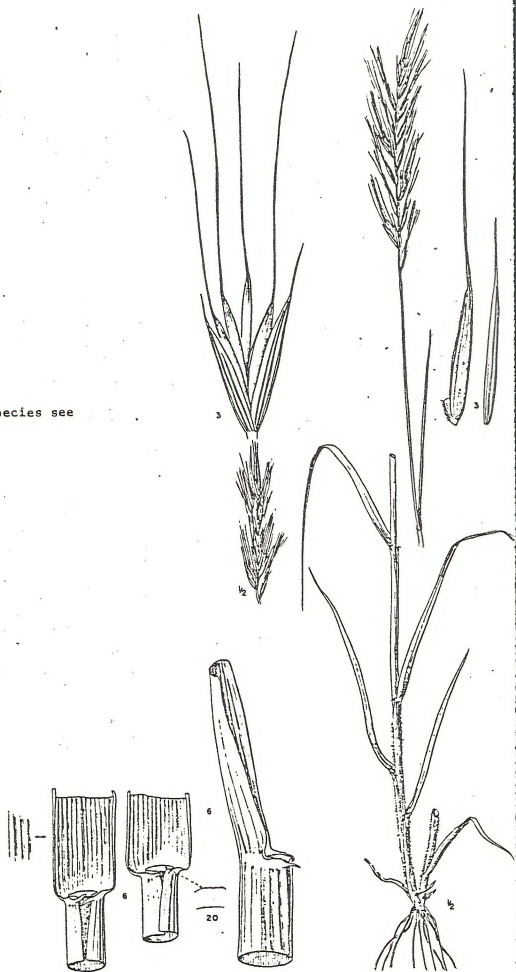


Agropyron spicatum

Agropyron subsecundum
BEARDED WHEATGRASS

For description of this species see

A. trachycaulum
SLENDER WHEATGRASS

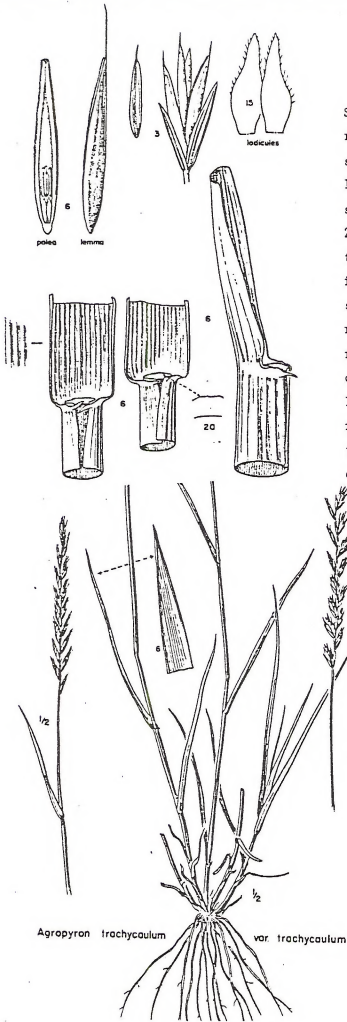


Agropyron subsecundum

Agropyron trachycaulum

SLENDER WHEATGRASS

Strongly tufted perennials, rarely producing rhizomes; culms 2-10 dm (12-40") tall, hollow; sheaths open, glabrous or hispid to pilose; ligules membranous, entire or erose-ciliate, scarcely 0.5 mm long; blades usually flat, 2-6 mm broad, scabrous to pilose, at least on the upper surface; auricles short or lacking; inflorescence a bilateral spike with solitary spikelets alternating on 2 sides of a continuous rachis, the spikelets borne flatwise to the rachis, spikelets laterally compressed, disarticulation above the glumes; spikes 4-15 cm (1½-6") long, compact, the spikelets overlapping, the rachis internodes 5-8 mm long in the middle of the spike; spikelets 9-16 mm long, 3- to 5-flowered; glumes lanceolate to oblong-elliptic, hyaline-margined, first glume 6-10 mm long, the second 7-12 mm long; lemmas 8-10 mm long, glabrous or scabrous toward the apex, sometimes ciliate margined, awnless to awned with a straight awn 1-4 or 5-30 mm long; lodicules lanceolate, about 1 mm long; anthers 1-1.8 mm long; June-August.



Agropyron trachycaulum var. trachycaulum

1. Lemmas awnless or awns less than 6 mm long; spikelets scarcely overlapping; the tips rarely reaching the base of those above on same site; spikes more than 10 cm long

..... A. trachycaulum var. trachycaulum
SLENDER WHEATGRASS

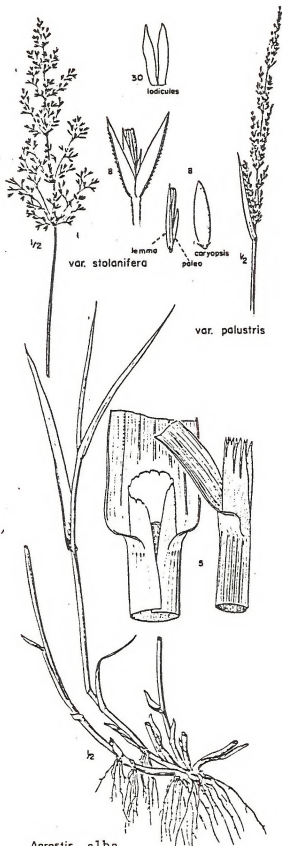
1. Lemmas awned, awns 10-30 mm long; plants more than 30 cm (12") tall

..... A. subsecundum
BEARDED WHEATGRASS

Agrostis alba

REDTOP

Rhizomatous perennial; culms 4-10 dm (16-40") tall, hollow, decumbent to erect; ligules truncate to obtuse, ligules of upper culm leaves 3-6 mm long, erose-ciliolate, often lacerate; sheaths open; blades flat, folded or involute, 2-6 mm broad; non-auriculate; inflorescence an open panicle, sometimes closing after anthesis, usually purple, 10-18 cm (4-7") long, panicle branches verticillate, curving upward and bearing spikelets from the base; disarticulation above the glumes; blumes lanceolate, subequal, acute, scabrous on the keel, 2-2.5 mm long; lemma 2/3 to 3/4 as long as the glumes, 1.4-1.8 mm long, awnless, membranous; callus minutely bearded; palea about 2/3 as long as lemma, 0.7-1.5 mm long; anthers about 1.3 mm long; lodicules about 0.4 mm long; plants of moist meadow habitats; introduced from Europe; Mid-June-early September.

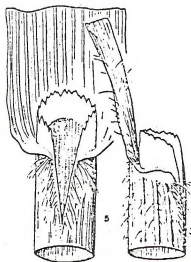
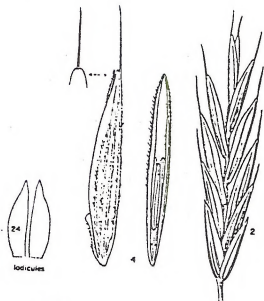


Agrostis alba

Bromus marginatus

MOUNTAIN BROME

Perennial, but often flowering the first season, without rhizomes; culms 6-9 dm (24-35") tall, hollow, glabrous to typically pubescent; sheaths closed nearly to the top, pilose; ligules membranous, 1-3 mm long, erose, glabrous to pilose; auricles, if present, very small; blades flat, 3-9 mm broad, scabrous to usually pilose; inflorescence a loosely contracted and nodding panicle, 10-20 cm (4-8") long; spikelets disarticulating above the glumes, 20-30 mm long, 4- to 7-flowered, strongly compressed; glumes lanceolate, strongly keeled, the first glume 7-11 mm long, 3- to 5-nerved, the second 9-13 mm long, 5- to 7-nerved; lemmas 11-15 mm long, carinate-keeled, glabrous to usually pubescent, the apex slightly bifid to entire; awns 3-8 mm long; anthers 1.5-3.5 mm long; late May-early August.

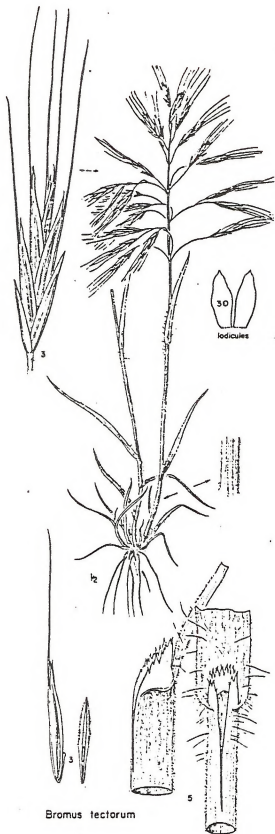


Bromus marginatus

Bromus tectorum

CHEATGRASS

Annual with soft hispid pubescence throughout; culms 1-5 dm (4-20") tall, hollow; sheaths closed nearly to the top; auricles lacking; ligules membranous, 1-3 mm long, lacerate-erose; blades flat, 2-3 mm broad; inflorescence a nodding, usually densely branched panicle, 6-12 cm (2-5") long, the lower panicle branches spreading or reflexed, usually bearing 4 or more spikelets; spikelets 3- to 6-flowered, to 2 cm long, broadest above midlength; glumes narrow-lanceolate to lanceolate, glabrous to villous, first glume 6-7 mm long, 1-nerved, the second 8-11 mm long, 3-nerved; lemmas 10-13 mm long, rounded to subcarinate on the back, 1-2 mm broad, glabrous to villous, somewhat longer than second glume, the teeth acuminate, 1-3 mm long; awn straight or slightly geniculate, 10-17 mm long; anthers 0.5-0.7 mm long; introduced, weedy; April-June.

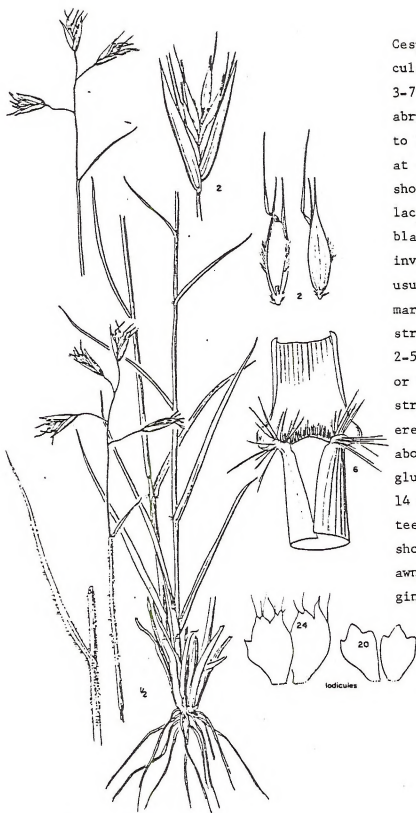


Bromus tectorum

Danthonia californica

CALIFORNIA OATGRASS

Cespitose perennial; culms hollow, disarticulating at the lower nodes at maturity, 3-7 dm (12-28") tall, glabrous, the nodes abruptly contracted; sheaths open, glabrous to long-pilose, bearing tufts of long hairs at the throat; ligule a dense fringe of short hairs, about 0.5 mm long, irregularly lacerate and ciliolate or a fringed crown; blades non-auriculate, flat to loosely involute, 2-4 mm broad and 10-25 cm long, usually short-pilose or ciliolate on the margins, scaberulous on the surfaces, strongly striate; inflorescence a panicle 2-5 cm long, bearing 3-5 widely spreading or reflexed spikelets, branches and pedicels strongly pubescent; spikelets 5- to 8-flowered, usually deep purple; disarticulating above the glumes and between the florets; glumes subequal, 14-18 mm long; lemmas to 14 mm long, including aristate terminal teeth to 4 mm long, glabrous on the back, short-pilose on the margins; callus villous; awns 7-12 mm long, twisted and scabrous margined on flattened lower portion; palea cleft, ciliate-keeled; anthers 2.5-4 mm long; lodicules about 0.5 mm long; plants of meadows and open slopes of higher precipitation zones; mid-June-August.



Danthonia californica

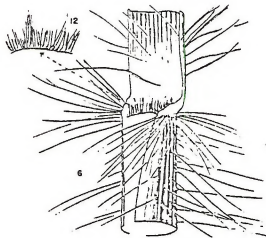
Danthonia unispicata

ONE-SPIKE OATGRASS



Danthonia unispicata

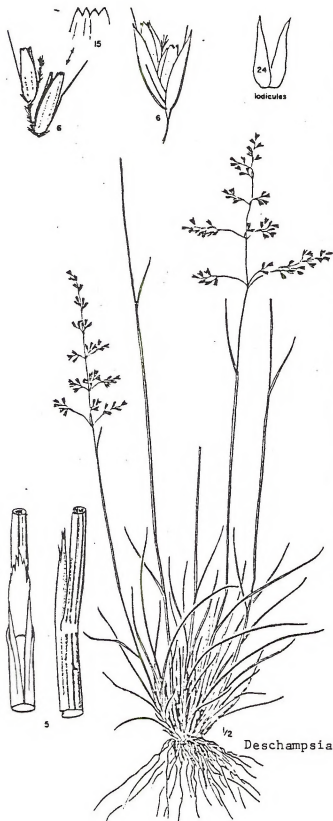
Cespitose perennial forming dense, spreading tufts with centers dying out with age; culms hollow, glabrous, the lower nodes abruptly constricted and readily disarticulating, 1.5-3 dm (6-12") tall; sheaths open, pilose with hairs from somewhat pustular bases, throat with dense tuft of hairs 2-4 mm long, collar light-yellow in contrast to bright green areas adjacent; ligule a dense fringe of hairs, less than 0.5 mm long; blades non-auriculate, flat to loosely involute, 1-2 mm broad and 3-8 cm (to 3") long, spreading pilose, the hairs denser on upper surface, strongly striate; inflorescence a panicle usually reduced to a single spikelet, rarely 2 or 3; spikelets 3- to 6-flowered, purple-tinged; disarticulating above the glumes and between the florets; glumes subequal, 14-20 mm long; lemmas 10-14 mm long, glabrous to scaberulous with villous lower margins, 7-nerved, apical lobes 2-3.5 mm long, callus bearded; awns 5-9 mm long, sometimes twisted on lower flattened portion; palea slightly shorter than lemma, ciliate-keeled; anthers 2-3 mm long; lodicules about 0.5 mm long; dry slopes to edge of dry meadows; June-August.



Deschampsia caespitosa

TUFTED HAIRGRASS

Strongly caespitose, tufted perennial; culms hollow, slender 2-8 dm (8-32") tall; sheaths open to base; ligules 3-7.5 mm long, narrow, acuminate, often lacerate; decurrent with the sheath; blades flat or folded, 1-3 mm wide, often scabrous above; inflorescence an open or contracted panicle 5-20 cm (2-8") long, loose often nodding, open to narrow; spikelets 2- to 3-flowered, usually shiny, purplish; the florets perfect, the rachilla usually hairy, prolonged beyond the terminal floret, disarticulating above the glumes and between the florets; glumes lanceolate, acute, glabrous or scaberulous, the first glume 3-5 mm long, 1-nerved, the second 3.2-5.2 mm long, 1- to 3-nerved; lemmas 2.5-4 mm long, often purplish basally, 5-nerved, the 4 lateral nerves leading into 4 apical teeth, the callus villose; awns slender, usually twisted and geniculate, attached below the middle of the lemma; palea more or less as long as the lemma; lodicules ovate-lanceolate, 0.7-1 mm long; anthers 1.5-2.2 mm long; plants of wet meadows and stream-bank habitats; late July-September.



Deschampsia caespitosa

Deschampsia elongata

SLENDER HAIRGRASS

Cespitose perennials with numerous tufted basal leaves and culms, the herbage usually glabrous below the inflorescence; culms hollow, slender 1-6 dm (4-24") tall; sheaths open to the base; ligules 2.5-7 mm long, narrow-lanceolate, acute to acuminate; blades mostly filiform, to flat or folded, the basal leaves about 1 mm broad, the cauline leaves sometimes up to 5 mm broad; inflorescence a contracted panicle 5-30 mm long, the branches ascending; spikelets 2- to 3-flowered, pale greenish to purplish, the hairs of the rachilla about 1 mm long; the florets perfect, the rachilla prolonged beyond the terminal floret, disarticulating above the glumes and between the florets; glumes narrow lanceolate, 3-nerved, scaberulose, the hairs sometimes confined to the nerves, usually exceeding the upper floret in length, the first glume 3.7-5.5 mm long, the second slightly shorter 3.5-5 mm long; lemmas 1.7-2.5 mm long, faintly 5-nerved, shiny, deeply bifid, the lobes weakly toothed or erose, the callus bearded with hairs about 1 mm in length; awns 1.5-5 mm long, nearly straight, attached just below the midlength of the lemma; palea nearly as long as the lemma; lodicules lanceolate, entire, 0.1-0.2 mm long; anthers very small, 0.3-0.5 mm long; plants of wet habitats; late June-August.

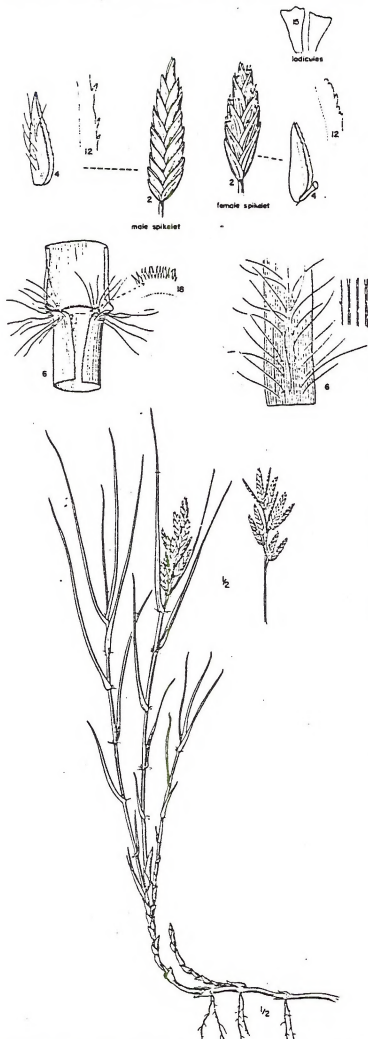


Deschampsia elongata

Distichlis stricta

INLAND SALTGRASS

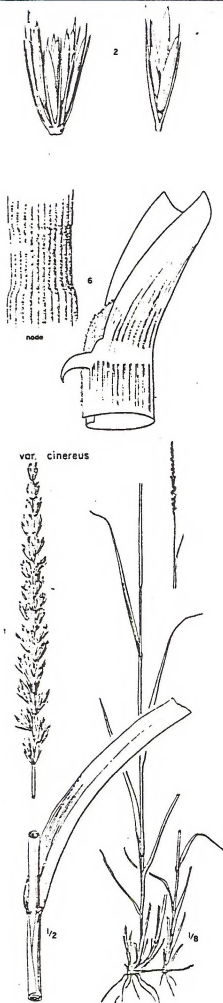
Strongly rhizomatous perennial, dioecious, rhizomes pungent; culms 10-45 cm (4-18") tall, solid, usually completely clothed to the inflorescence by the distichous, closely overlapping leaves; inflorescence relatively few flowered and comprised of compact panicles; panicles 4-8 cm (1 1/2-3 1/8"), with a few, \pm congested spikelets; spikelets of both sexes 9-15 mm long, strongly compressed; staminate spikelets yellowish, 7- to 16-flowered; pistillate spikelets more greenish, 5- to 9-flowered; first glume about 3.5 mm long, the second about 5 mm long; staminate spikelets disarticulating above the glume and between the florets; lemmas membranous (staminate) to chartaceous (pistillate), the staminate lemmas 3.5-5.5 mm long and the longer pistillate lemmas, 4.5-8 mm long; paleas about 5.5 mm long, the pistillate with margins about 1 mm long at the widest point, the winged keel \pm 0.35 mm wide, irregularly and shallowly crenate-serrate above, the keel of staminate paleas narrow, entire to remotely serrulate; the paleas of pistillate florets slightly shorter than lemma while staminate paleas slightly longer than the lemma; plants of moderately moist to moist alkaline soils; June-September.



Elymus cinereus

BASIN WILDRYE

Robust, densely tufted perennials, often forming clumps up to 1 m across, typically without rhizomes, but rarely producing short, thick rhizomes; culms usually more than 7 dm (28") tall, often as tall as 20 dm (80"); culms erect, glabrous or more often harshly puberulent, especially so at the nodes; sheaths open, glabrous to soft hairy with appressed or spreading hairs; ligules relatively long 2-7 mm, membranous; blades flat or nearly so, 4-5-15 mm broad, strongly nerved, the auricles usually well developed to nearly lacking on some leaves; inflorescence a spike 11-20 cm long, 7-12 mm broad, stiff, erect; spikelets usually 3-6 per node, occasionally only paired, 11-20 mm long, 3- to 5-flowered; spikelets disarticulating above the glumes and between the florets; glumes subequal, 7-13 mm long, narrow, nearly subulate, tapered, often as long as the spikelet, scabrous on the angles, sometimes slightly bowed apart at the base; lemmas 8-10 mm long, minutely hirsute, sometimes glabrous, usually nerveless below, becoming 5- to 7-nerved above, awnless or more often with a short awn up to 5 mm long; anthers 4.5-6.2 mm long; lodicules often very prominent and hairy at the tip; plants of dry uplands to moderately moist bottomlands; June-early August.

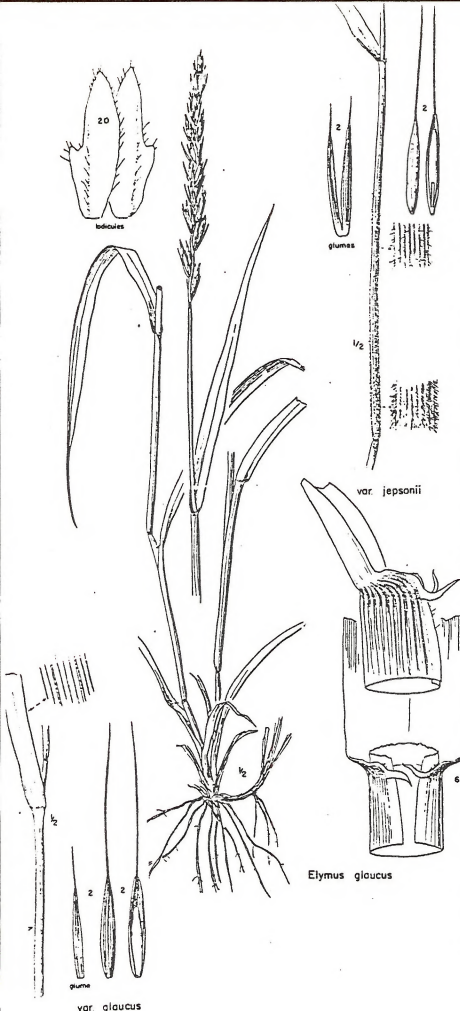


Elymus cinereus

Elymus glaucus

BLUE WILDRYE

Green to glaucous, loose to densely tufted perennial, sometimes short stoloniferous; culms 8-14 dm (32-56") tall, hollow; leaves scattered along the culm; sheaths glabrous, retrorsely puberulent or pilose, the collar often purple; sheath open; ligules short 0.3-1 mm long, truncate, erose-ciliculate or sometimes entire; blades flat to sometimes slightly involute, 4-12 mm broad, mostly scabrous or sparsely pilose, sometimes glabrous below, the auricles mostly well developed, about 2 mm long and clasping the culm; inflorescence a spike 6-16 cm (2 1/3 - 6 1/3") long, erect, somewhat loose or interrupted below and overlapping above or dense throughout; spikelets mostly 2 per node, 10-16 mm long, 2- to 4-flowered; disarticulation occurs above the glumes and between the florets; glumes subequal 9-14 mm long, narrow-lanceolate, broadest above the base 3- to 5-nerved, almost parallel and concealing the base of the enclosed florets, glabrous to scabrous, tapering into a short awn, sometimes slightly indurate at the base but membranous above; lemmas 8.5-12 mm long, 5-nerved above, glabrous to scabrous on the nerves, tapering into a long, slender and mostly straight awn that is 1-2 times the body-length; anthers 1.7-3 mm long; lodicules often very prominent and hairy at the tip; plants of higher precipitation zones (above 14") and mountain meadow habitats; July-August.



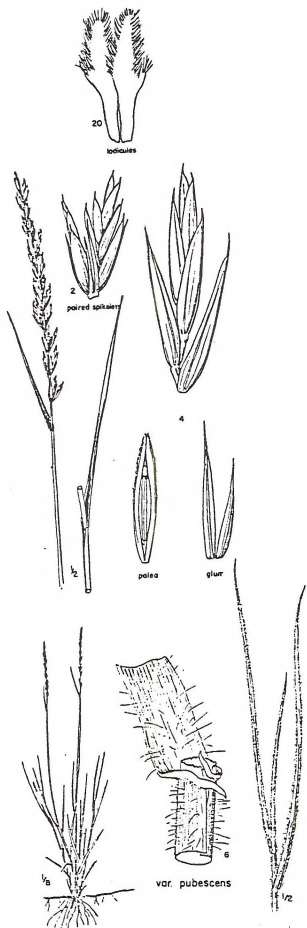
Elymus glaucus

var. *glaucus*

Elymus triticoides

CREEPING WILDRYE

Glaucous or sometimes green perennials from extensively creeping rhizomes; culms 3-7 dm (12-28") tall, hollow; sheaths open glabrous, scabrous or puberulent with spreading hairs; ligules very short 0.2-0.7 mm long, truncate, erose-ciliolate; blades flat or usually involute, 2.5-5 mm broad, rather stiff, scaberulous, sometimes glabrous below, the auricles well developed and often clasping the culm; inflorescence a spike relatively short, 3.5-7 cm (1 3/8 - 2 3/4") long, erect, loose and open to rather dense, slender, sometimes compound; spikelets paired or solitary at each node, 10-16 mm long, 3- to 5-flowered, greenish, brownish to purple; disarticulating above the glumes and between the florets; glumes subequal, 7-10 mm long, narrow to subulate, firm, 1- to 3-nerved, mostly scabrous; lemmas 6-9 mm long, often shiny and smooth, glabrous or puberulent, sometimes puberulent apically only, faintly to prominently 5- to 7-nerved, rounded on back or keeled toward the tip, awnless or with a short awn 0.5-2.5 mm long; anthers 3.5-5 mm long; lodicules often very prominent and hairy at the tip; plants of moist river bottoms and meadows; May-August.

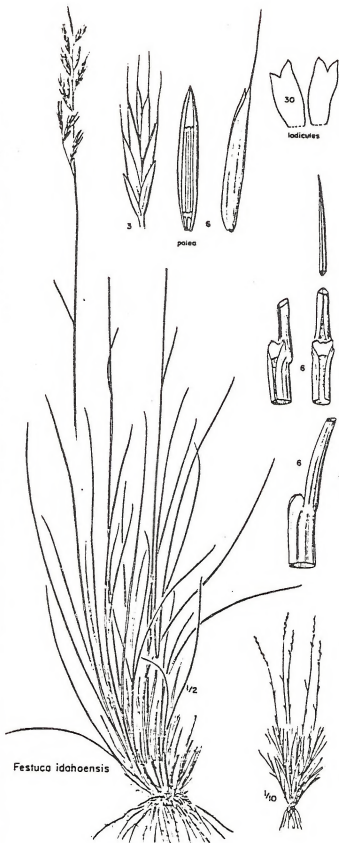


Elymus triticoides

Festuca idahoensis

IDAHO FESCUE

Cespitose perennials, glabrous to scaberulous (sometimes minutely villous below), non-rhizomatous; culms 4-6.6 dm (16-27") tall; sheaths open; leaves mostly basal, the tuft 15-25 cm (6-10") high, usually more than half the length of the culms, the sheaths remaining firm and entire; ligules mostly 0.3-0.6 mm long, ciliate; blades filiform, folded-involute, less than 1 mm broad and without auricles; inflorescence a panicle 7-12 cm (2 3/4 - 4 3/4") long, loosely compressed and sometimes somewhat directed to one side of the axis; spikelets loosely 8-12 mm long, 5- to 6-flowered, the rachilla joints usually visible, disarticulating above the glumes and between the florets; glumes linear-lanceolate to lanceolate, acute to obtuse, the first glume 3-4 mm long, the second 4-5.5 mm long; lemmas 5-7 mm long, rounded, glabrous to scaberulous, the awns 2-6 mm long; palea often pubescent; anthers 2.5-4 mm long; lodicules entire, serrate or lobed, acuminate to truncate; dry slopes of higher precipitation zones (above 12"); May-August.

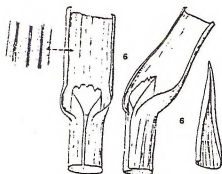
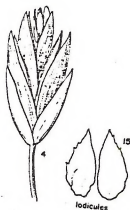


Festuca idahoensis

Hesperochola kingii

SPIKE FESCUE

Incompletely dioecious, strongly rhizomatous, coarse perennials, often growing in ring-like tufts up to 2 m in diameter; culms hollow, stout, 3-10 dm (12-40") tall, arising from dense clumps of straw-colored remnants of old sheaths and culms; sheaths open, smooth, striate; ligules scarious, 1-3.5 mm long, erose-ciliolate; blades flat, 2-3.5 mm broad and 20-40 cm (8-16") long, erect, glaucous, coarsely striate; inflorescence a panicle, congested but occasionally open, 3-15 (1.2-6") long, branches spikelet-bearing nearly to the base; spikelets 6-10 mm long, 3- to 5-flowered, laterally compressed, the staminate spikelets somewhat longer than the pistillate, disarticulation occurs above the glumes and between the florets; glumes broadly lanceolate, subscarious to smooth and shining, the first 3.5-5.5 mm long, 1-nerved, the second 4-6.5 mm long, 3-nerved; lemmas 4.5-8 mm long, ovate, acute or acuminate, sometimes slightly awned, uniformly scabrous, faintly 5-nerved; palea about as long as the lemma, ciliate on the keels; anthers 2.5-4.5 mm long; stigmas long and bushy appearing; lodicules, 1-1.5 mm long, ovate often with serrate margins; plants of sagebrush slopes and ridges of higher precipitation zone (above 14"); June-August.



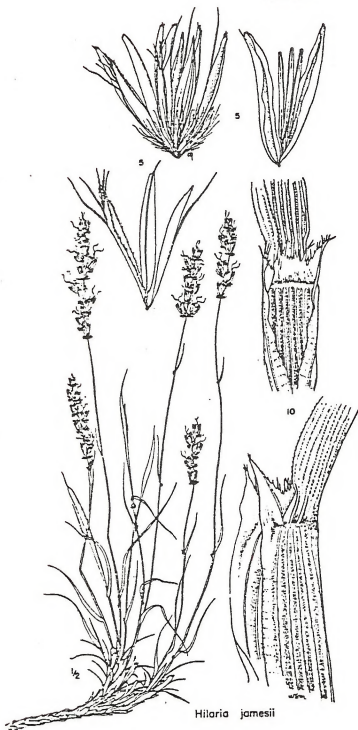
Hesperochola king



Hilaria jamesii

GALLETA

Strongly rhizomatous or stoloniferous perennial; culms solid, 15-40 cm (6-15") tall, sometimes decumbent at the base; leaves mostly basal; inflorescence a slender, dense spike with clusters of 3 spikelets at each node of a zig-zag rachis, these spikelet groups falling from the axis entire; inflorescence a spike 3-5 cm (1 3/16 - 2") long; spikelet groups long-villous at the base; glumes of lateral spikelets subequal, 5-7 mm long, the first glume asymmetrical, awned from a displaced midnerve at one side, the awn 3-6 mm long, the second glume awnless or very shortly awned; glumes of central spikelet subequal, 4-6 mm long, with 5 nerves extending into an irregular awn 2-5 mm long; lemmas of lateral and central spikelets 6-7 mm long; the single lemma of central spikelet bearing a dorsal awn from below the bifid apex, the awn 1-3 mm long; palea shorter than lemma; plants of dry upland soils; May-August.



Hilaria jamesii

Hordeum brachyantherum

MEADOW BARLEY

Tufted perennials; culms hollow, erect or sometimes spreading, 3-7 dm (12-28") tall; sheaths open, glabrous, or with spreading pubescence; ligules short, 0.2 - 0.7 mm long, truncate, ciliolate; blades flat, 2-5 mm broad, scabrous to pilose; at least above, the auricles lacking; inflorescence a spike 2-5 cm (3/4 - 2") long (measurement excluding the awns), erect, green or brownish-purple in matured plants; the spikelets form a triad at each node, (following disarticulation, the rachis segment remains with the spikelet triad), the central spikelet sessile, the lateral spikelets borne on curved pedicels 0.7-1 mm long, their florets much reduced, rarely staminate; glumes awn-like, 7-20 mm long; lemma of the fertile floret 6.5-8 mm long, faintly 5-nerved, glabrous to scabrous above, tapering into a short awn 5-10 mm long; anthers 1-1.8 mm long; plants of moist meadow habitats; June-August.

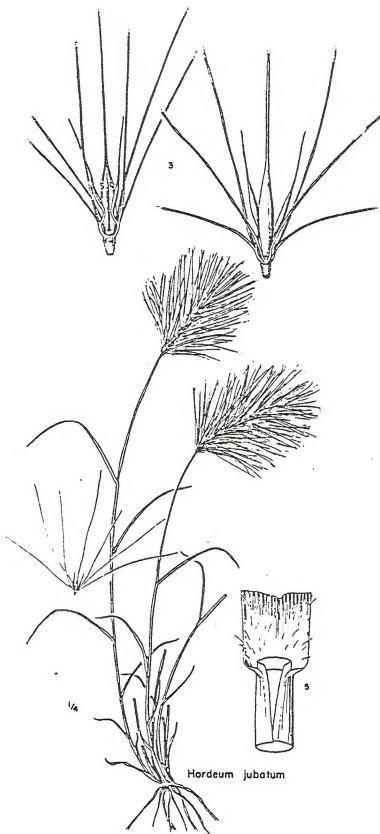


Hordeum brachyantherum

Hordeum jubatum

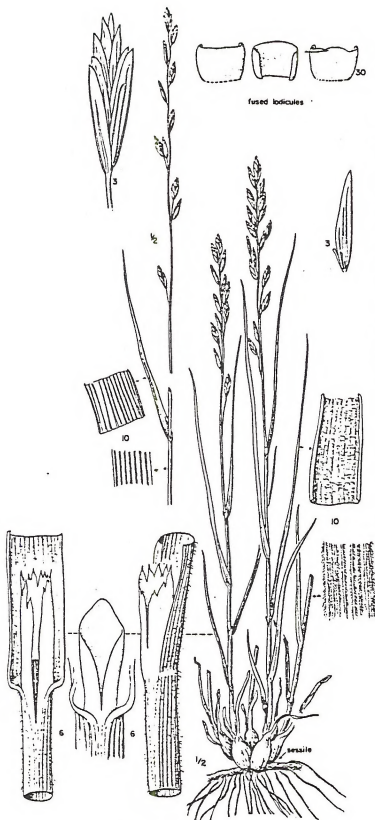
FOXTAIL BARLEY

Tufted perennials, sometimes flowering the first year, from glabrous to densely soft pubescent throughout; culms hollow, erect or decumbent 3-7 dm (12-28") tall; sheaths open, glabrous to pilose; ligules 0.5-1 mm long, truncate, erose or entire, ciliate; blades flat to involute, 1.5-4 mm broad, scabrous to minutely hirsute, the auricles usually lacking, or when present less than 0.5 mm long; inflorescence a spike 4-10 cm (1 2/3 - 4") long (measurement excluding the awns), nodding, often purplish at maturity, the rachis disarticulating and pulling apart by the spreading awns, the spikelets form a triad at each node, (following disarticulation, the rachis segment remains with the spikelet triad), the central spikelet sessile, the lateral spikelets borne on curved pedicels 0.7-1.2 mm long, their florets reduced, borne on rachilla, joint about 0.7 mm long; glumes long and awn-like, 25-60 mm long; lemma of the fertile floret 5.5-8 mm long, faintly 5-nerved, tapering into a long awn 10-60 mm long; palea subequal to the lemma; anthers 1-1.5 mm long; plants of moist to wet meadow habitats; June-August.



Melica bulbosa
BULBOUS ONIONGRASS

Tufted perennials; culms hollow 3-10 dm (12-40") tall, the bulbous bases clustered on short rhizomes; sheaths glabrous to scaberulous, sometimes short-pilose, closed nearly full length; ligules 2-5 mm long, often deeply lacerate; blades flat to involute, 2-4 mm broad, glabrous to scabrous; inflorescence a panicle 10-16 cm (4-6½") long, narrow, elongate, the branches short and erect; spikelets 10-13 mm long, 3- to 6-flowered, the rudiment exserted, nearly 3.5 mm long, disarticulating above the glumes and between the florets; glumes ovate, obtuse, scaberulous, membranous or papery, the first glume 6-8 mm long, 3-nerved, the second 7-9 mm long, 5-nerved; lemmas 8-9.5 mm long, obtuse to rounded or sometimes emarginate, with a purple-tinged band within the scarious margins and apex, scaberulous 9- to 11-nerved, awnless; palea with ciliate nerves; anthers 2.5-3.5 mm long; lodicules often fused forming a collar around 1/2 to 2/3 of the ovary base; late May-August.

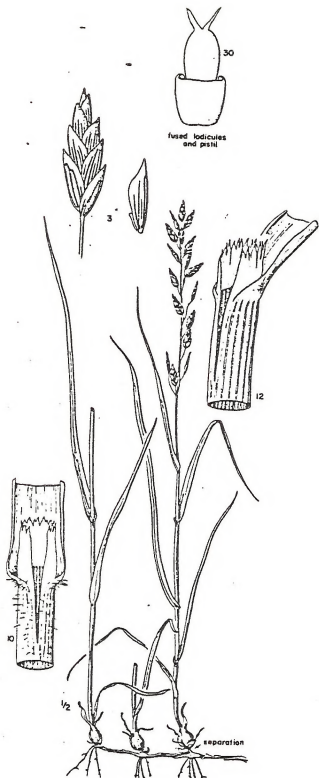


Melica bulbosa

Melica spectabilis

PURPLE ONIONGRASS

Rhizomatous perennials; culms hollow, 2.5-7.5 dm (10-30") tall, bulbous at the base, the bulbs not attached directly to the rhizome but connected by a slender stem and spaced at intervals along the rhizome; sheaths glabrous to pilose, sometimes open at the top; ligules 1.2-3.2 mm long, erose-lacerate, acute to truncate; blades flat, folded or involute, 1-4 mm broad, glabrous to scabrous, at least above; inflorescence a panicle 8-13 cm (3 $\frac{1}{2}$ -5 $\frac{1}{2}$ ") long, narrow or sometimes somewhat open, the branches often flexuous; spikelets 10-15 mm long, 4- to 7-flowered, about 2.5 mm long, disarticulating above the glumes and below the florets; glumes obtuse to broadly ovate, membranous, scabrous on the nerves, the first glume 4-6 mm long, 1- to 3-nerved, the second 5-7.5 mm long, 7- to 9-nerved; lemmas 7-8.5 mm long, broadly ovate to obtuse, sometimes emarginate or bifid, scabrous, often a purple-tinged band within the scarious margins and apex, 9- to 15-nerved, the strong nerves alternate with weak ones, awnless; palea with ciliate nerves; anthers 1.8-2.6 mm long; lodicules often fused forming a collar around 1/2 to 2/3 of the ovary base; June-August.

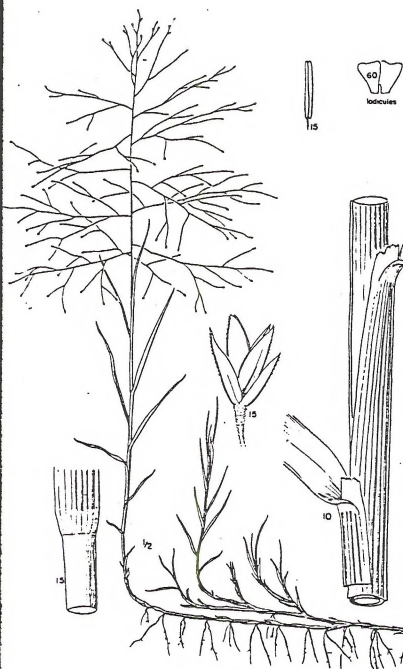


Melica spectabilis

Muhlenbergia asperifolia

ALKALI MUHLY

Glaucous perennials with long, scaly rhizomes; culms 1-5 dm (4-20") tall, slender or ascending, branching at the base, compressed, hollow; sheaths open, compressed-keeled, glabrous, overlapping, somewhat cartilaginous towards the edges with the blades abruptly widened immediately above the collar, finely pubescent on the margins; collar yellowish-brown; ligules 0.2-0.8 mm long, truncate, finely erose-ciliate, somewhat decurrent; blades flat or folded, 1-2.5 mm broad and about 2-5 cm (3/4-2") long, crowded, scabrous, sometimes finely puberulent on the upper surface; inflorescence a large panicle 6-14 cm (2 3/8-5 5/8") long and nearly as wide, open, diffuse, the lower branches often remaining enclosed by the upper sheaths, the slender scabrous branches widely spreading, often flexuous, the pedicels slightly enlarged below the spikelets, the panicle breaking away at maturity; spikelets 1- to 2-flowered, often deep-purple, disarticulating above the glumes; glumes subequal, small, 0.7-1.7 mm long, acute to nearly mucronate; lemmas 1.2-1.6 mm long, only slightly longer than glumes, 3-nerved, thin, broad, minutely mucronate, often with a blackish cast; palea as long or slightly longer than the lemma and about as broad; anthers about 1 mm long; lodicules short, rarely as much as 0.3 mm long; plants of moist, alkaline meadow habitats; July-August.

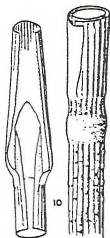
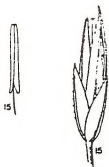


Muhlenbergia asperifolia

Muhlenbergia richardsonis

MAT MUHLY

Mat-forming perennials from hard, creeping, scaly rhizomes; culms solid, short 1-2.5 dm (4-10") tall, erect or decumbent at the base, often geniculate at the nodes, becoming much-branched at the base; sheaths open, glabrous, striate; collar usually brownish, somewhat cartilaginous towards the edges; ligules 1-2 mm long, acute, strongly decurrent; blades often nearly flat or involute towards the tip or involute throughout, 1-1.5 mm broad and 1-5 cm long, tapered to a pointed tip, tip often sharp and stiff, puberulent above and scaberulous beneath; inflorescence a panicle 1-4 cm long, narrow and spike-like, the branches short, appressed; spikelets 1-flowered, green to nearly black, disarticulating above the glumes; glumes subequal, small, 1-1.3 mm long, the mid-nerves prominent, the first glume 1-nerved, the second 3-nerved; lemma 2-2.5 mm long, about twice as long as the glumes, 3-nerved, usually mucronate or shortly awn-tipped, the awn up to 0.3 mm long; callus naked; palea about the same length as the lemma; anthers 1.2-1.5 mm long; lodicules short, rarely as much as 0.3 mm long, fleshy; plants of moist, to moderately moist habitats; July-September.

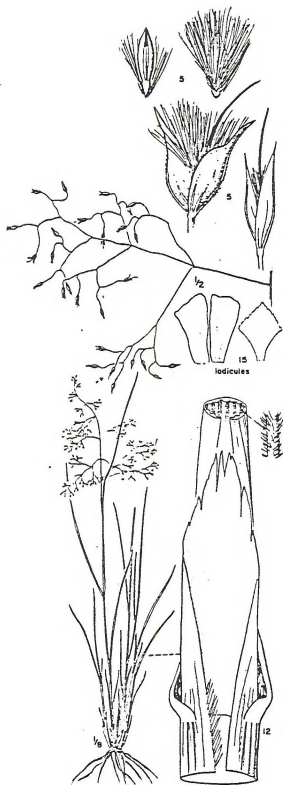


Muhlenbergia richardsonis

Oryzopsis hymenoides

INDIAN RICEGRASS

Densely tufted, caespitose perennials; culms 3-6 dm (12-24") tall, hollow with thick walls; sheaths open, glabrous to puberulent, often partly buried by the soil surface, persisting and becoming papery and finally fibrous in old clumps; ligules 2.5-7.5 mm long, acuminate, entire, becoming lacerate; blades strongly involute, about 1 mm wide, nearly as long as the culms, numerous, smooth; inflorescence a panicle 7-14 cm (2 3/4-5 2/3") long, the slender branches in pairs, branchlets divaricately spreading, often flexuous; spikelets 1-flowered, disarticulating above the glumes; glumes ovate-acuminate or with a tail-like appendage, sometimes tapering into an awn up to 2 mm long, 3-nerved, the nerves prominent at the greenish base, becoming indistinct in the anthocyanous portion above, the margins hyaline, finely puberulent to nearly glabrous, the first glume 5-7.5 mm long, the second 4.2-6.5 mm long; lemma 2.5-4 mm long, spindle-shaped, swollen or inflated, dark brown to nearly black at maturity, shiny, densely pilose-hirsute, the whitish hairs nearly extending the length of the glumes; the callus short and blunt and often bearded with hairs about the same length as those on the lemma body; awn 3-5.5 mm long, straight, readily deciduous; palea slightly shorter than the lemma; lodicules nearly 2 mm long, the longer pair wedge-shaped, the third somewhat diamond-shaped and slightly shorter; anthers 0.8-1.2 mm long with an apical tuft of hairs; May-early July.

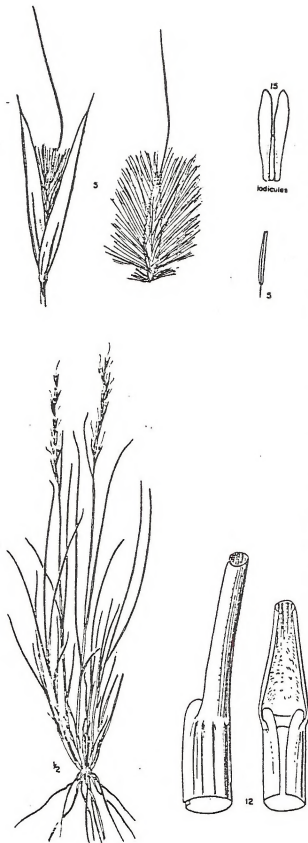


Oryzopsis hymenoides

Oryzopsis webberi

WEBBER RICEGRASS

Low, densely tufted perennials; culms solid, 1-2.5 dm (4-10") tall, erect from a decumbent base and with numerous innovations; sheaths open, usually shiny and smooth; leaves in basal tufts, numerous, the tufts clothed in old leaf sheaths; ligules short, 0.2-0.5 mm long, somewhat higher on the conspicuous edges than towards the back, subentire; blades strongly involute-filiform, 5-9 cm (2-3.6") long, straight or often flexuous, glabrous to scaberulous below and puberulent above; inflorescence a short panicle, 3-6 cm (1.2-2.4") long, narrow, the few branches appressed and the base often enclosed in the upper sheath; spikelets 1-flowered disarticulating above the glumes; glumes subequal, 7.5-10 mm long, narrow-lanceolate, acuminate, glabrous; usually purplish, obscurely 3- to 5-nerved; lemma 4.5-6 mm long (including the callus), copiously pilose, the whitish hairs 2-3.5 mm long, the summit with 2 papery teeth 0.5-1 mm long; callus 0.3 mm long, blunt with shorter and more dense hairs than those of the lemma body; awn short 5-7 mm long, straight or weakly once-geniculate, not twisted, glabrous, readily deciduous; anthers 1.4-2.4 mm long; lodicules slender, the larger lateral pair about 1.5 mm long and the middle half as long; Mid-June-August.



Oryzopsis webberi

Phleum alpinum

ALPINE TIMOTHY

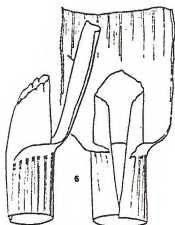
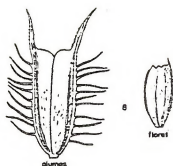
Tufted perennials; culms, hollow, 2-4.5 dm (8-18") tall, often decumbent; sheaths open, glabrous, the collar with unequal sides; ligules 0.5-3 mm long, truncate, subentire; blades flat, 2.5-6 mm broad, scabrous on the margins, sometimes on the surfaces; auricles, when present, are small and blunt to rounded; inflorescence a contracted, dense, spike-like panicle 1-5 cm (3/8-2") long and 8-12 mm broad when flattened, ovoid to cylindrical; spikelets 1-flowered, laterally flattened, disarticulating above the glumes, but sometimes below the glumes at maturity; glumes subequal, 2.5-3.5 mm long, abruptly tapering to the stout awns, the keels ciliate and margins scabrous (although the first glume sometimes with a ciliate margin) the awns 1.5-2.2 mm long; lemma 1.7-2.5 mm long, lanceolate-ovate, truncate, glabrous, shiny to sometimes puberulent, margins erose-toothed; palea slightly shorter than the lemma; anthers 1.1-1.5 mm long; lodicules about 1 mm long; plants of mountain meadow habitats; late June-August.



Phleum pratense

TIMOTHY

Tufted perennials; culms hollow, 5-10 dm (20-40") tall, usually bulbous at the base; sheaths open, glabrous; ligules 2-3 mm long, subentire, obtuse, sometimes lacerate; blades flat, 3-6.5 mm broad, scabrous-margined, sometimes with small auricles; inflorescence a contracted, dense, spike-like panicle 4-11 cm (1 2/3-4 3/8") long and 5-7.5 mm wide when flattened; spikelet 1-flowered, more than twice as long as broad, laterally flattened, disarticulating above the glumes, but sometimes below the glumes at maturity; glumes subequal, 2-3.2 mm long, abruptly truncate, with an awn, the keel strongly ciliate and often scabrous on the sides, 3-nerved, the lateral nerves close to the keel, the first glume slightly narrower and sometimes villous-margined, the awns 1-1.2 mm long; lemma 1.7-2 mm long, ovate, truncate and erose, faintly 5-nerved, puberulent, sometimes with a minute awn; palea nearly as long as the lemma; anthers 1.2-1.7 mm long; lodicules about 0.3 mm long, oblong; plants of moist meadow and streambank habitats; introduced; late June-September.

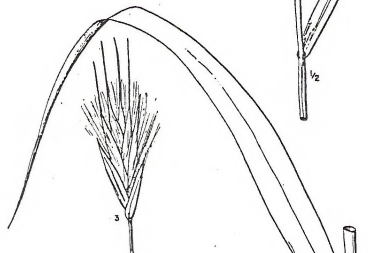
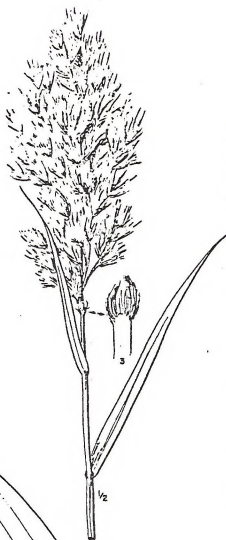
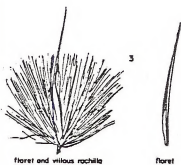


Phleum pratense

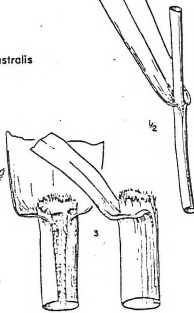
Phragmites communis

COMMON REED

Tall, robust, perennial reeds with creeping rhizomes or stolons, forming large colonies; culms hollow, 2-3 m (to 6') tall; sheaths open; ligule a short, fringed membrane or composed entirely of hairs; blades flat 1-4 cm (to 1½") broad; inflorescence a large, open panicle 15-35 cm (6-14") long, often purplish, becoming straw-colored; spikelets 10-15 mm long, 3- to 6-flowered, disarticulation above the glumes and between the florets, the rachilla with long hairs, 7-9 mm long; glumes lanceolate, glabrous, the first glume 4-6 mm long, 1- to 3-nerved, the lateral nerves sometimes joining with mid-nerve and not reaching apex, the second glume 6-9 mm long, 3- to 5-nerved; lemmas 9-15 mm long, linear; palea shorter than lemma, 3-4 mm long; plants of ponds, seeps, streams and marshes; July-September.

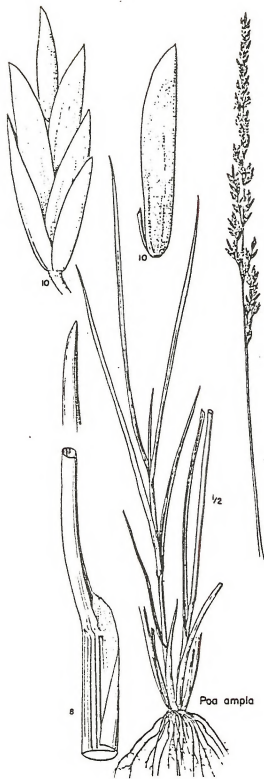


Phragmites australis



Poa ampla
BIG BLUEGRASS

Strongly tufted perennial, occasionally producing rhizomes; culms hollow, 6-13 dm (24-51") tall; sheaths smooth to scaberulous, usually shorter than the internodes, open less than $\frac{1}{2}$ their length, those of the culms often with conspicuous auricles; ligules rather thick, 1-2 mm long, normally rounded sometimes truncate; leaves with 2 median lines on upper surface and tips boat shaped, basal leaves numerous, 10-30 cm (4-12") long, blades mostly flat 1.5-3.5 mm broad, becoming involute on drying, culm blades shorter, blades usually scabrous only on the margins, glaucous; inflorescence a narrow, panicle 10-18 cm (4-7") long, densely flowered, the branches mostly erect; usually pale green but sometimes purple-tinged; spikelets 6-10 mm long, disarticulation above the glumes and between the florets, relatively narrow, pointed, terete, 3- to 5-flowered; glumes acuminate, slightly unequal, usually 3-nerved, the first glume 3-4.5 mm, the second 3.5-5 mm long, about as long as the first floret; lemmas 4-6 mm long, obtuse to rounded on apex, usually rounded on the back below and becoming slightly keeled above, yellowish-green, margins scarios often brownish, without basal web, lemmas usually glabrous or scaberulous over the back, sometimes finely crisp-purberulent below, the nerves sometimes more scaberulous than lemma body; palea subequal to lemma; anthers 2-3 mm long; lodicules about 0.7 mm long; plants of open slopes at higher elevations; May-July.



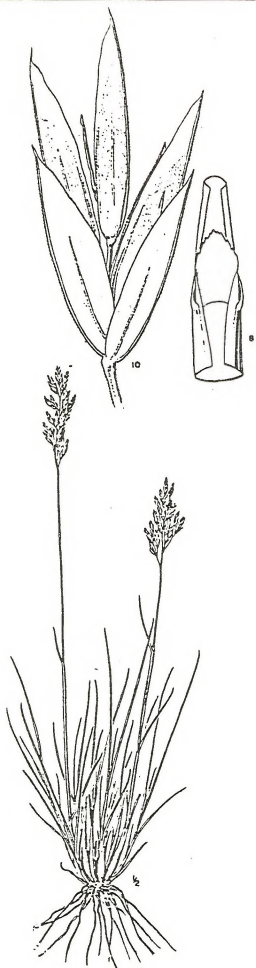
Poa canbyi
CANBY BLUEGRASS

Strongly tufted perennial, green or glaucous; culms 4.5-8 dm (18-32") tall, hollow, often tinged with purple below; blades mostly basal, forming large rosettes; sheaths smooth, closed about $\frac{1}{2}$ their length, usually shorter than the internodes; blades with 2 median lines and boat-shaped tips, flat or folded 1-3 mm broad, the basal cluster of leaves 15-30 cm (6-12") high, the few culm leaf blades 5-7 cm (2-3") long; inflorescence a loose to rather compact panicle, 9-16 cm (3 $\frac{1}{2}$ -6") long, branches short, erect; spikelets 6-9 mm long, 2- to 5-flowered, little compressed, narrow and pointed, tawny and shiny, brownish, sometimes purple-tinged; disarticulating above the glumes and between the florets; glumes smooth, lanceolate, acute, scarios margined, the first glume 2.5-4 mm long, 1-nerved, the second 3-5 mm long, 3-nerved; lemmas lanceolate, 4-5.5 mm long, rounded below $\frac{1}{2}$ keeled above, often crisp-puberulent below especially on the central and marginal nerves, margins scarios as is obtuse to acute apex, base not webbed; anthers 1.5-2.5 mm long; lodicules about 0.6 mm long; plants of open slopes of higher precipitation zones (above 12"); actively growing during summer months; June-August.



Poa cusickii
CUSICK BLUEGRASS

Strongly tufted, dioecious perennial; basal leaves numerous, often forming large bunches; culms hollow, 2-5 dm (8-20") tall, numerous, usually with 2 short leaves near the base; sheaths closed about half their length; ligules acute, 0.5-3 mm long, those of the basal leaves very short and nearly truncate; blades variable, the basal usually involute, 0.5-1 mm broad, often 1-2 dm (to 8") long, those of the culms similar but shorter, or more or less flat and 1-3.5 mm broad; typically scabrous, sometimes obscurely so, culm leaves with long sheaths and short blades, leaves with 2 median lines and boat-shaped tips; inflorescence an ovoid, compact panicle 3-7 cm (1 1/4-2 3/4) long, usually pale and shiny, sometimes purple-tinged; spikelets 6-9 mm long, strongly compressed, 3- to 4-flowered, usually on filiform pedicels, disarticulation above the glumes and between the florets; florets typically pistillate, or some plants with perfect florets; these usually associated with rather open panicles; glumes broad, subequal, usually 3-nerved, the second 3-6 mm long, shorter than first floret; lemmas 4-7 mm long, prominently 5-nerved, acute, scabrous, sometimes with a few hairs on keel, scarious on margins and apex, often with purple tinge at the middle; typically without basal web; anthers 2.2-3.2 mm long; lodicules about 0.8 mm long; plants of open slopes at middle elevations; May-July.

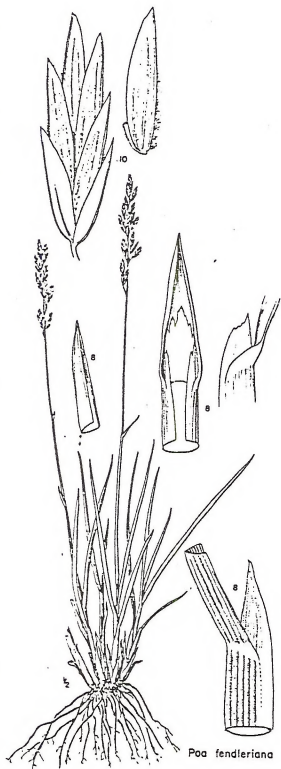


Poa cusickii

Poa fendleriana

MUTTONGRASS

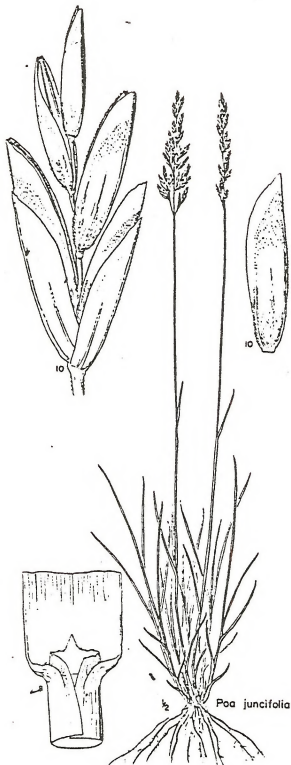
Strongly tufted, dioecious, perennial; basal leaves numerous, glaucous, firm and stiff; culms 2-6 dm (8-24") tall, usually scabrous on the upper part, hollow; sheaths open nearly their full length, rarely closed 1/3 their length, somewhat scabrous; ligules variable, often truncate and 0.5-1 mm long, to much elongate acuminate and mostly 3-8 mm long, ligules always scaberulous-puberulent and usually erose to jagged and \pm ciliolate; blades with 2 median lines and boat-shaped tips, usually scabrous, sometimes flat, typically folded or involute on the margins, 1.5-3 mm broad; culm blades becoming increasingly reduced and often lacking so the ligule tops the bladeless sheath; inflorescence an oblong, contracted panicle 5-10 cm (2-4") long and 1-2 cm broad, pale to deep purple; spikelets closely flowered, 6-8 mm long, 3- to 6-flowered, strongly compressed and keeled throughout, disarticulation above the glumes and between the florets; florets typically pistillate, occasionally with seemingly perfect flowers; glumes slightly unequal, the second considerably broader, 3.5-5 mm long; lemmas 4-6 mm long, blunt, apex erose, \pm villous on keels and marginal nerves, scabrous to blabrous between; base not webbed; anthers about 3 mm long; lodicules about 0.7 mm long; plants of open slopes at middle elevations; July-August.



Poa juncifolia

ALKALI BLUEGRASS

Strongly tufted perennial, occasionally producing rhizomes; culms 3-7 dm (12-28") tall, hollow; sheaths smooth, glabrous, usually shorter than the internodes, open about $\frac{1}{2}$ their length; ligules 1-2 mm long, usually rounded or obtuse, sometimes truncate, ligules of basal blades inconspicuous; leaves with 2 median lines on upper surface and tips boat-shaped, blades tightly involute, greenish, to 20 cm (8") long and typically less than 2 mm broad, smooth or scabrous, sharp-pointed; inflorescence a narrow panicle, 7-15 cm (3-6") long, branches short, erect, pale green or sometimes tinged with purple; spikelets 5-8 mm long, 2- to 5-flowered, narrow, terete, disarticulation above the glumes and between the florets; glumes acute, margins scarious, slightly unequal, 3-5 mm long, first glume lanceolate, the second broader; lemmas 3.5-5.2 mm long, obtuse at apex, nerves obscure, disappearing into scarious margins, rounded on the back towards the base, slightly keeled above, smooth, minutely scabrous, without a basal web; palea subequal to lemma; anthers 1.8-2.5 mm long; lodicules 0.7 mm long; plants of moist to dry, saline or alkali meadow habitats; May-July.



Poa nevadensis

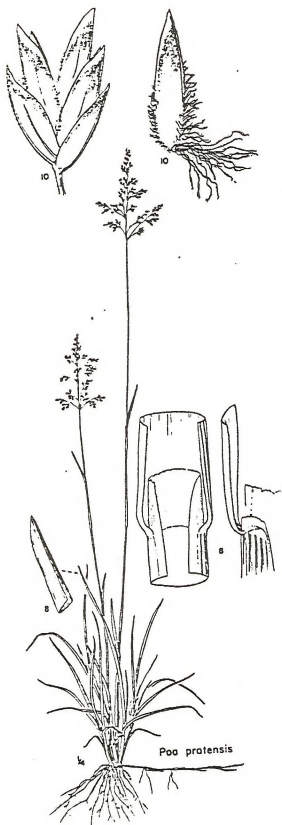
NEVADA BLUEGRASS

Strongly tufted perennials; culms hollow, 3-10 dm (12-40") tall; plants leafy throughout but mostly in a basal cluster 13-25 cm (5-10") high; sheaths glabrous to scabrous, closed little more than $\frac{1}{2}$ their length; ligules acute to acuminate, typically $\frac{1}{2}$ lacerate, those of basal leaves 1-1.5 mm long; those of the culms mostly 3-6 mm long, ligules decurrent and wider than the blade; leaves with 2 median lines and boat-shaped tips, blades flat or folded, sometimes becoming involute on drying, 1-3 mm broad to 30 cm (12") long; inflorescence a narrow panicle 10-18 cm (4-7") long, usually yellowish-green, sometimes tinged with purple, the short branches appressed; spikelets 5-8 mm long, narrow, pointed, terete, 2- to 6-flowered, disarticulation above the glumes and between the florets; glumes scabrous, slightly unequal, the first 2.7-4.2 mm long, the second 3-5 mm long, about equal to the first floret, 1- to 3-nerved; lemmas 3.5-5 mm long, the first usually subequal to the second glume, more rounded than keeled on the lower portion, usually scabrous over the entire back surface, sometimes glabrous or slightly crisp-puberulent near the base; may be purplish below the $\frac{1}{2}$ obtuse, scarious apex; palea ciliate on keel scabrous otherwise; anthers 1.5-3 mm long; lodicules about 0.7 mm long; plants of relatively moist open slopes and meadow habitats; June-July.



Poa pratensis
KENTUCKY BLUEGRASS

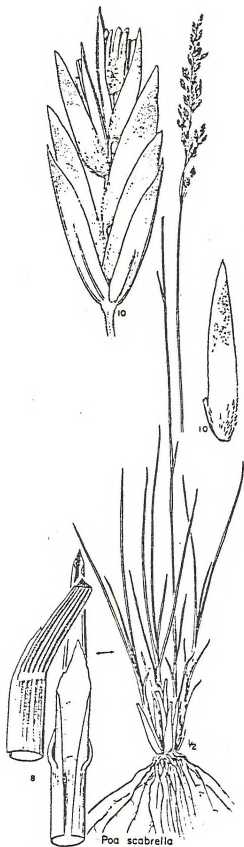
Strongly rizomatous perennial forming dense sods; culms subterete, hollow, 3-7 dm (12-28") tall; sheaths smooth, closed about half their length; ligules shorter than wide, 0.5-1.7 mm long, truncate, mostly entire, those on culm leaves to 3 mm long; leaves with 2 medium lines and boat-shaped tips, typically folded, sometimes flat, 1-3 mm broad, usually with scabrous margins, sometimes slightly pubescent and purplish near the collar; inflorescence and open, often pyramidal panicle 4-11 cm (to 4 3/8") long, with spreading or erect branches in whorls of 4 or 5 spikelets 4-5 mm long, ovate, crowded, 2- to 4-flowered, green or purplish, strongly compressed, disarticulation above the glumes and between the florets; glumes scabrous on the keel, the first glume 1.8-2.5 mm long, 1-nerved, the second 2.2-3.3 mm long, 3-nerved; lemmas 2.5-4 mm long, 3- to 5-nerved, obtuse or acute, with copious cobwebby hairs at the base, the keel and marginal nerves with long, silky hairs, glabrous between; anthers 0.8-1.9 mm long; lodicules about 0.7 mm long; plants of moderately moist meadow habitats; introduced; May-August.



Poa scabrella

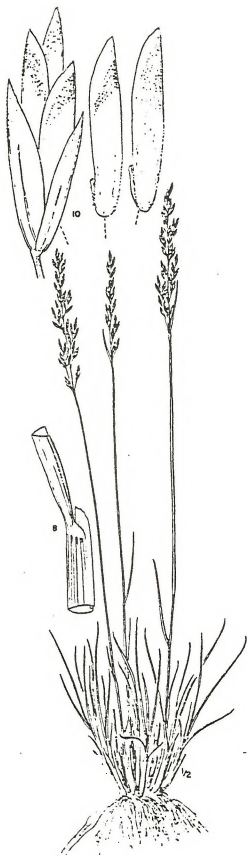
PINE BLUEGRASS

Strongly tufted perennial; clumps 3-6 dm (12-24") tall, hollow, smooth or scabrid; leaves mostly basal; sheaths closed only at the base, typically scabrous, sometimes smooth, often purplish; ligules 2-7 mm long, acuminate, becoming lacerate, sometimes noticeably decurrent; leaves with 2 median lines and boat-shaped tips, blades flat or folded, lax, 1-3 mm broad, scabrous on both surfaces to merely rough on the margins only, the basal tuft of leaves 8-15 cm (3-6") high; inflorescence a narrow panicle, 6-12 cm (2 3/8 - 4 3/4") long, green with tinges of purple, more often brown; spikelets 6-8 mm long, 2- to 5-flowered, very little compressed, nearly terete, disarticulation above the glumes and between the florets; glumes obscurely 3-nerved, glabrous to normally slightly scabrous, acute to acuminate, scarios-margined, first glume 2.7-4.5 mm long, the second 3-5 mm long; lemmas 4-5.5 mm long, erose at the subacute apex, rounded on the back, keeled above, becoming puberulent below, scarios on the margins and apex, base not webbed; palea about as long as lemma, ciliate-scabrous on the keels; anthers 0.6-2.3 mm long; lodicules about 0.6 mm long; plants of dry habitats at low to middle elevations; April-July



Poa secunda
SANDBERG BLUEGRASS

Strongly tufted perennial, plants often \pm completely purple-tinged; culms hollow, 2-3.5 dm (8-14") tall, wiry; culm leaves usually 1 sometimes 2; sheaths typically glabrous, sometimes scabrous, closed only at the base; ligules acute, prominent, those of basal leaves less than 1.5 mm long and those of culm leaves more than 2.5 mm long; blades folded or involute, rarely flat, 0.5-1.5 mm broad and 3-5 cm (to 2") long, often becoming curled, the basal cluster of leaves 3-10 cm high, leaves with 2 median lines and strongly boat-shaped tips; inflorescence a narrow to open panicle 3-7 cm (to 3") long, branches short, erect; spikelets 6-9 mm long, 2- to 4-flowered, little compressed and terete, narrow and pointed, usually purple-tinged; disarticulation above the glumes and between the florets; glumes acute, scabrous, hyaline-margined, first glume 2.2-4 mm long, 1-nerved, the second 3-5 mm long, 3-nerved; lemmas 4-5 mm long, rounded below, slightly keeled above, becoming crisp-puberulent below especially on the central and marginal nerves, scarios on the margins and \pm acute apex, not webbed at base; anthers 1.5-2 mm long; lodicules about 0.8 mm long; plants of dry habitats at low and middle elevations; April-June.



Poa secunda

Polypogon monspeliensis

RABBITFOOTGRASS

Tufted annuals; culm hollow, 0.3-4 dm (1½-16") tall, often decumbent at the base and rooting at the nodes; sheaths open, smooth to minutely scabrid; ligules prominent 2-6 mm long, puberulent, acute, lacerate-erose at the tip; blades usually flat, 1.5-5 mm broad, glabrous to scaberulose; inflorescence a dense, contracted, spike-like panicle, 1-6.5 cm (3/8 - 2 2/3") long, the branches short, appressed-ascending; spikelets 1-flowered, disarticulation below the glumes; glumes subequal, 1.5-2.5 mm long, scabrous to hispidulous with longer hairs on the keel and margins, especially towards the base, awned from between rounded lobes of a bifid apex, the awns 4.5-9.5 mm long; lemma about half the length of the glumes, 0.7-1.2 mm long, ovate, smooth and shiny, minutely toothed at the broad apex; awn absent or very short and straight; palea nearly as long as the lemma; anthers 0.4-0.5 mm long; lodicules oblong-lanceolate, about 0.2 mm long; weedy, introduced; plants of moist habitats; April-August.

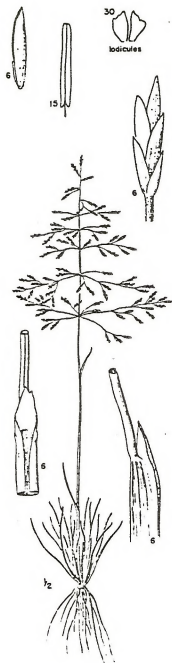


Polypogon monspeliensis

Puccinellia lemmonii

LEMMON ALKALIGRASS

Cespitose perennials, without rhizomes; culms decumbent, hollow, 1.5-4 dm (6-24") tall, slender; sheaths free, but overlapping; leaves mostly basal, 4-10 cm (1 2/3-4") long; ligules usually 1-2 mm long, erose-lacerate; blades filiform, involute, mostly less than 0.5 mm broad in their involuted condition, more or less glabrous; the inflorescence a panicle 4-10 cm (1 1/2-4") long, pyramidal to rather narrow, the branches slender, flexuous, fascicled, the lower naked in the lower half; spikelets 5-7 mm long, 2- to 4-flowered, florets imbricate, 2-ranked, disarticulating above the glumes and between the florets; glumes narrow-ovate, the first glume 0.8-1.5 mm long, the second 1.5-2.5 mm long; lemmas 2.2-3.3 mm long, glabrous, acute, rarely obtuse, faintly 3-nerved; palea about as long as the lemma; anthers 1.2-2 mm long; lodicules free, usually about 0.5 mm long or less, hyaline; plants of moist alkaline habitats; June-July.

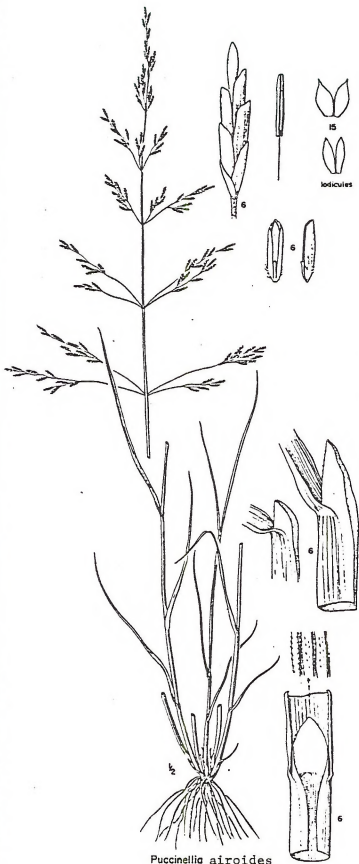


Puccinellia lemmonii

Puccinellia airoides

NUTTAL ALKALIGRASS

Cespitose perennials, without rhizomes; culms hollow, erect, 3.5-7 dm (14-28") tall; sheaths free, but overlapping; ligules obtuse, 1-3 mm long; blades 1-3 mm, flat to $\frac{1}{2}$ involute; inflorescence a panicle 10-25 cm (4-10") long, open, pyramidal or elongate at maturity, the branches divaricate, rarely reflexed, the lowest bearing spikelets mostly above the middle; spikelets slender, 4-8 mm long, 3- to 7-flowered; the florets imbricate, 2-ranked, disarticulating above the glumes and between the florets; glumes narrowly ovate, the first glume 0.6-1.5 mm long, the second 1-2.4 mm long; lemmas 2-3 mm long, broadly oblong, narrowed into an obtuse apex, erose-ciliate, obscurely nerved; palea about as long as the lemma; anthers 0.7-1.2 mm long; lodicules free, usually about 0.5 mm long or less, hyaline; plants of moist alkaline habitats; late May-early August.

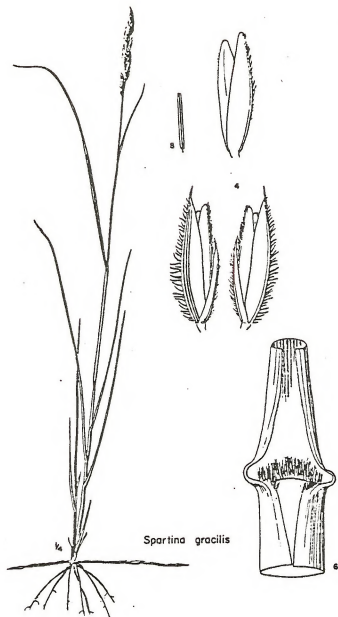


Puccinellia airoides

Spartina gracilis

ALKALI CORDGRASS

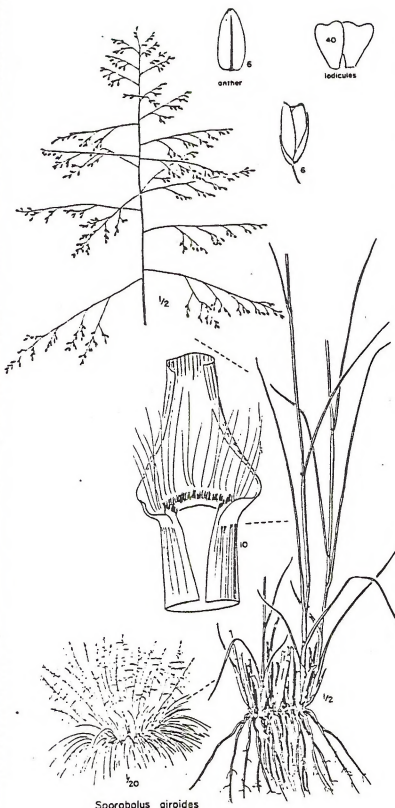
Strongly rhizomatous perennials, the rhizomes 3-5 mm thick with overlapping scales; culms hollow, solitary, 3-7.5 dm (12-30") tall, erect, glabrous; leaves tough and firm; sheaths open, smooth to striate, glabrous; ligule a fringe of hairs, 0.5-1.5 mm long; blades flat, becoming involute in drying, 2.5-5 mm broad at the base and 15-20 cm (6-8") long, scabrous on the upper surface and margins, glabrous beneath; inflorescence a panicle 8-16 cm (3-6½") long with 2 to 6 racemously arranged, appressed spikes along a central axis, spikes 2-4.5 cm (3/4-1 3/4") long; spikelets closely spaced, 18-28 per spike, each 1-flowered, spikelets occur in 2 rows on 2 sides of the 3-angled rachis, the rachis tip naked, often hidden by the terminal spikelet, disarticulation occurs below the glumes; glumes glabrous except for the ciliate keel, the first 3.5-5 mm long, linear, mucronate, the margins minutely hispid, the second 7-8.5 mm long, slightly exceeding the lemma, narrow-lanceolate, 5-nerved, the lateral nerves near the midnerve, the lateral nerves and/or the keel nerve scabrous to ciliate, awnless or mucronate; lemma long 6.2-7.5 mm, lanceolate, usually blunt tipped, 1-nerved, the keel ciliate, at least towards the apex, otherwise glabrous; palea large, subequal to the lemma, lanceolate, thin and papery, glabrous, the 2 nerves close together; anthers 2.5-5 mm long; plants of moist, alkaline habitats; June-September.



Spartina gracilis

Sporobolus airoides

ALKALI SACATON



Sporobolus airoides

Stout, tufted perennials, the base of the large clumps densely clothed with slick and shiny, cream-colored sheaths; culm 4-9 dm (16-36") tall, glabrous, terete, usually hollow, but sometimes loosely pith-filled; sheaths open, glabrous or slightly pilose at the upper corners of the margins; ligules very short, mostly a dense band of hairs; blades flat to strongly involute, 2-4 mm broad, smooth on the lower surface, finely scaberulous above and sparsely to copiously hirsute near the throat; inflorescence a panicle 12-40 cm (4 3/4-16") long, open and pyramidal, 10-18 cm (4-7 1/2") broad, often fully exerted or the lower part remaining enclosed in the sheath, spikelet bearing mostly toward the tips of the branches; disarticulation occurs above the glumes; spikelets with glumes often deciduous before the floret; glumes acute, 1-nerved, scarious or often hyaline throughout, glabrous, the first glume 0.7-1.2 mm long, the second about twice as long 1.5-3 mm; lemma usually longer than the second glume, 1.8-2.3 mm long, acute; palea more or less as long as the lemma, usually splitting as the plump caryopsis ripens; anthers relatively large 1.2-1.5 mm long, lodicules usually less than 0.5 mm long; plants of moist, saline-alkali soils; June-September.

Sporobolus cryptandrus

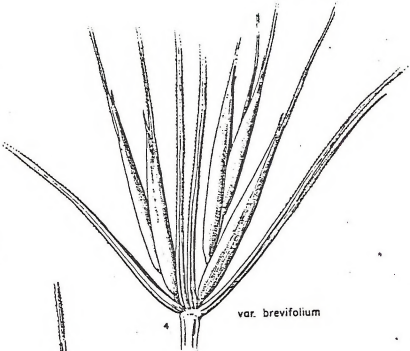
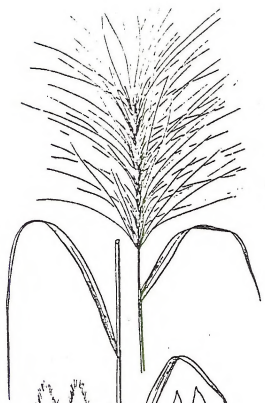
SAND DROPSEED

Tufted perennials, sometimes appearing like annuals; culm 4-7 dm (16-28") tall, erect or decumbent below, glabrous, solid; sheaths open, strongly overlapping, glabrous, with pubescent margins and long pilose tufts at the upper corners of the margin, hairs 2-3 mm long, sometimes pilose in a line across the collar, but more often glabrous; ligules about 0.5 mm long, composed of a line of dense hairs; blades usually flat, more or less involute in drying, becoming involute towards the tip, 1.5-4 mm broad and 5-15 cm (2-6") long, the margins cartilaginous and scabrous; inflorescence a panicle 10-20 cm (4-8") long, open 2.5-4 cm wide, the lower part usually included in a sheath or sometimes entirely included, the branches spikelet-bearing to near the base, usually rather stiffly ascending, glabrous; spikelets pale, glabrous, the glumes occasionally deciduous at maturity, disarticulation above the glumes; glumes acute, 1-nerved, the first 0.7-1 mm long sometimes nearly subulate, hyaline, usually scabrous on the keel and otherwise glabrous or scabrous on the body near the keel, the second glume twice as long, 1.4-1.8 mm long, broader; lemma about as long as the second glume, 1.5-2 mm long, acute; palea about as long as the lemma; anthers about 0.5 mm long; lodicules short, more or less fleshy, usually at least as broad as long; plants of dry, sandy soils; June-August.

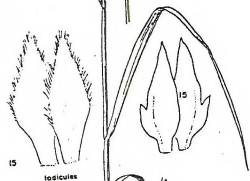


Sporobolus cryptandrus

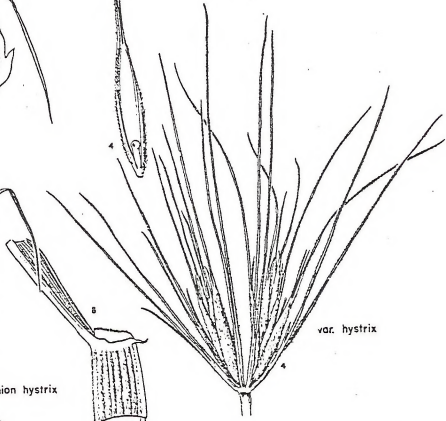
SITANION



var. brevifolium



lodicules



var. hystrix

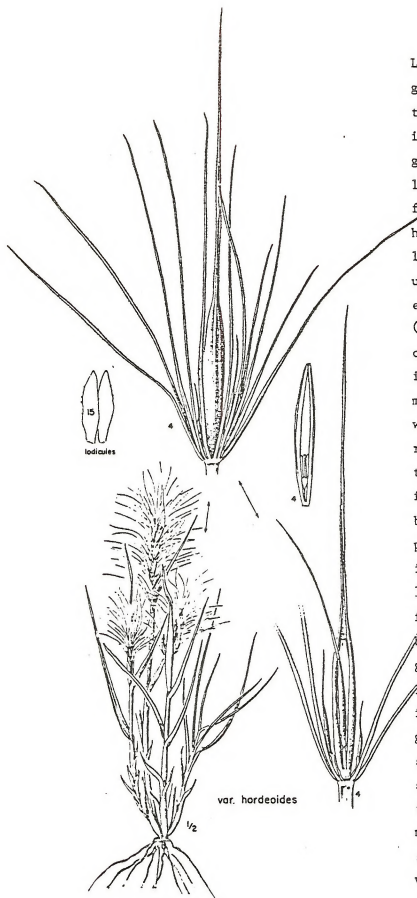


Sitanion hystrix

see following plate for illustration of Sitanion hystrix var. horaeoides

Sitanion hystrix
BOTTLEBRUSH SQUIRRELTAIL

Loosely to densely tufted perennials, subglabrous or puberulent to white villous throughout; culms hollow, erect to spreading, 1-4.5 dm (4-18") tall; sheaths open, glabrous to pilose; ligules short, mostly less than 0.5 mm long, truncate; blades flat to folded or involute, 1-4 mm broad, hirsute to villous, sometimes glabrous below, the auricles inconspicuous, sometimes up to 0.5 mm long, often purplish; inflorescence a spike 3-12 cm (1½-4 ¾") long (measurement excluding the awns) from very compact to loose and open, often included in the upper sheaths or in robust specimens entirely exerted, often at maturity with only the lower part remaining, the rachis disarticulating and pulled apart by the spreading awns and the rachis segment falling with a spikelet pair; spikelets born flat-wise to the rachis, mostly in pairs, sometimes in 3s, or often solitary in the upper part of the spike, mostly 1- to 6-flowered, the placement of reduced florets varying, sometimes all fertile, but sometimes the lower one sterile and glume-like, the awns of the glumes and lemmas 20-70 mm (¾-2 ¾") long, varying from green to red or often purplish; glumes long, 35-85 mm long, subulate or sometimes broader, extending into slender, spreading, scabrous awns, entire or sometimes divided into 2 short, unequal segments; lemmas 8-10 mm long, glabrous to strong puberulent, faintly 3- to 5-nerved with the main nerve extending into a slender to stout, divergent or straight



Sitanion hystrix (cont from preceding plate)

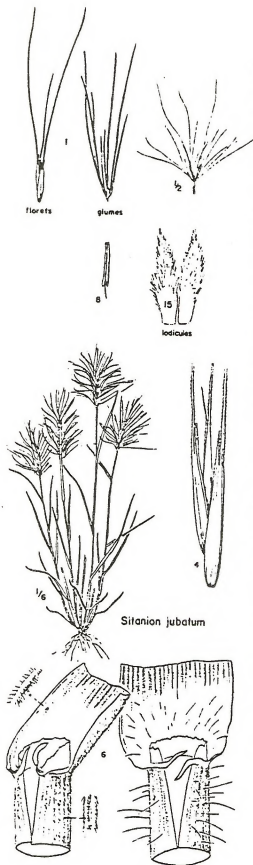
Sitanion hystrix (Cont'd)

to flexuous awn, with 2 of the lateral nerves also extended into bristles nearly 10 mm long; palea subequal to the body of the lemma, 2-nerved, the nerves often extending as bristles; anthers about 2 mm long; lodicules oblanceolate, often ciliate; plant of diverse habitats; late May-August.

- 1 Spikelets usually 2 at each node of the rachis, if more than some florets of the lateral spikelets fertile.
- 2 Lowermost floret of one or both spikelets at each node sterile and reduced to a glume-like structure.
 - 3 Glumes tending to be 2-cleft, at least one of the glumes at each node; awns of the glumes longer than those of the lemmas; low lands from s. B.C. and sw. Mont., s. through e. Oregon, Idaho and sw. Wyo. to s. Calif., nw. Ariz., Utah and w. Colo. var. hystrix
 - 3 Glumes entire; awns of the lemmas longer than those of the glumes; mid-elevs. to arctic-alpine places from B.C. to Mont., s. to Calif., Nev. and Utah. var. californicum
- 2 Lowermost floret fertile, not at all reduced; an ecologically diverse variety ranging from the deserts to the highest mountains; Ore., s. Mont. and S.D., s. to Calif., Ariz., N.M. and Texas. var. brevifolium
- 1 Spikelets 3 at each node of the rachis; the florets of the central spikelet fertile, those of the lateral spikelets rudimentary; low lands of e. Wash., e. Oregon and adj. Idaho, s. to n. Calif. and n. Nev. var. hordeoides

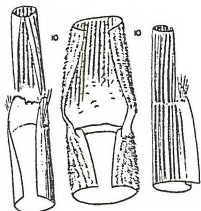
Sitanion jubatum

BIG SQUIRRELTAIL

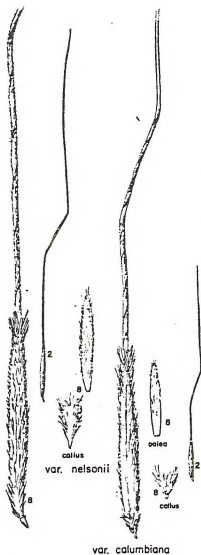


Densely caespitose perennials with many flowering culms; culms hollow, 2-4 dm (8-16") tall, puberulent; sheaths open, glabrous to pilose; ligules short, 0.2-0.7 mm long, mostly entire; blades flat to involute, 1.5-3.5 mm broad, scabrous to pilose, the auricles generally well developed, 0.5-1.5 mm long, usually ascending; inflorescence a spike 5-10 cm (2-4") long (measurement excluding the awns), dense, with a bristly appearance, exerted to slightly included in the upper most leaf sheaths, at maturity the rachis readily disarticulating above each node and the rachis segment falling with the spikelet pair, the spreading awns mechanically separating the inflorescence into 1-node units; spikelets born flatwise to the rachis, mostly in 2s, rarely in 3s or 4s, few to several-flowered, the lower most florets of one or sometimes both spikelets sterile, reduced to a structure similar to the glumes, the awns of the glumes and lemmas 25-70 mm (1-2 3/4") long, mostly red or purplish, rarely green; glumes long, 25-100 mm long, 3- to 9-cleft, the divisions extending into scabrous, divergent awns of unequal lengths; lemmas 8-10 mm long, faintly 3- to 5-nerved, tapering into a straight, scabrous awn up to 100 mm (4") long, the 2 lateral nerves often extending into bristles of awns up to 20 mm long; palea subequal to the lemma, the 2 nerves extending as bristles up to 2 mm long; anthers 1-2 mm long; lodicules oblanceolate, often ciliate; plants usually of higher precipitation zones (above 12"); May-July.

Stipa columbiana
COLUMBIA NEEDLEGRASS



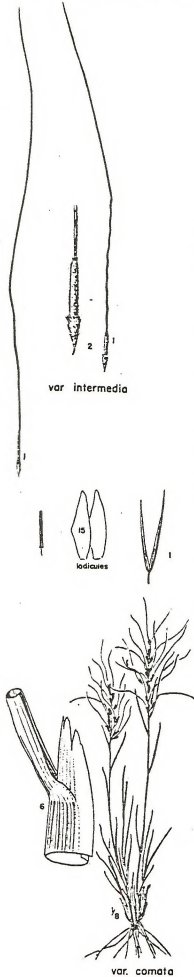
Stout tufted perennials; culms hollow or solid, relatively tall, 4-10 dm (16-40"), erect; sheaths open, glabrous to densely pubescent, strongly ribbed; ligules mostly 0.2-1 mm long, truncate, usually longest on the sides, decurrent; blades involute but sometimes flat and 2.5-5 mm broad, 10-20 cm (4-8") long, glabrous or slightly scaberulous to densely pubescent, often strongly striate; inflorescence a panicle 12-25 cm long, narrow, compact or rather loose with the lower branches separated from the remainder of the inflorescence, the branches short and appressed with numerous spikelets; spikelets 1-flowered, large, disarticulating above the glumes; glumes subequal, 7-11 mm long, acuminate or awn-pointed, somewhat purplish, scaberulous, papery, becoming somewhat hyaline above, 3-nerved; lemma 5.5-7.2 mm long (including the callus), appressed pubescent, the hairs usually longer at the tip (0.7-1.5 mm long) than below (0.2-0.5 mm long), the callus short, 0.7-1 mm long; awn 20-30 mm (3/4-1 1/4") long, thin, twice geniculate, the lower segments twisted and scabrous, the terminal segment 10-16 mm long, not twisted, scaberulous to glabrous; palea shorter than the lemma, pubescent; lodicules about 1.5 mm long, slender; anthers 2.2-3 mm long; plants of higher precipitation zones (above 14"); June-September.



Stipa columbiana

Stipa comata
NEEDLEANDTHREAD

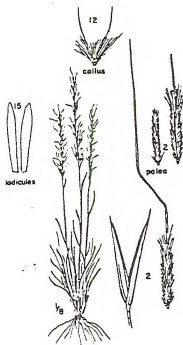
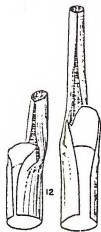
Tufted perennials; culms hollow or solid, 3-8 dm (12-32") tall, glabrous, often puberulent at the nodes; sheaths open, smooth to scabrous, strongly ribbed, usually longer than the internodes; leaves mostly basal; ligules relatively long, 1-5 mm, usually acute, becoming lacerate, decurrent, more or less puberulent; blades involute, or if flat up to 3 mm broad, 10-30 cm (5-15") long, smooth to scaberulous beneath, scabrous on the upper surface; inflorescence a panicle 18-34 cm (7 $\frac{1}{2}$ -13 $\frac{2}{3}$ ") long, narrow, usually partly enclosed in an inflated sheath, the branches usually slender and ascending, the spikelets sometimes drooping at anthesis; spikelets 1-flowered, large, disarticulating above the glumes; glumes long and narrow, tapering to a fine point, 5-nerved, slightly rolled, glabrous, papery, the margins and tip hyaline, the first glume 18-30 mm long, the second 15-27 mm long; lemma 10-12.5 mm long (including the callus), pale green to yellowish or brownish, sparsely appressed-pilose, often \pm glabrous apically, the hairs 0.2-0.5 mm long, the callus very sharp, about 3 mm long, densely barbed with tawny hairs, the hairs 1-2 mm long; awn 70-160 mm (2 $\frac{3}{4}$ -6 $\frac{2}{3}$ ") long, one or twice geniculate, the first joint distinct, the second indistinct or more often merely flexuous, the lower segment tightly twisted, scabrous, the terminal segment scabrous, not twisted, 40-90 mm (1 $\frac{2}{3}$ -3 $\frac{2}{3}$ ") long; palea nearly as long as the lemma, pubescent between the nerves; lodicules lanceolate, about 1.5 mm long; May-July.



Stipa comata

Stipa lettermanii
LETTERMAN NEEDLEGRASS

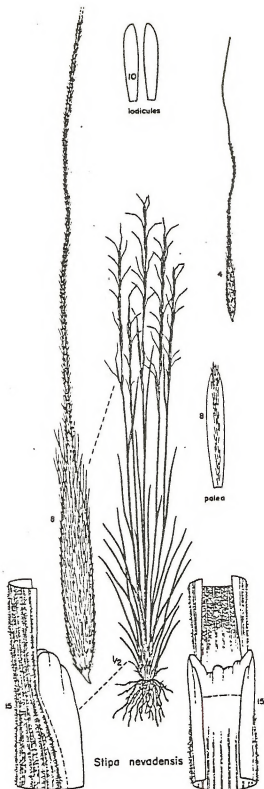
Tufted perennials, often forming large clumps; culms hollow or solid, 2.5-6 dm (10-24") tall, glabrous or minutely scaberulous, with numerous innovations; sheaths open, glabrous, sometimes scaberulous; ligules 0.1-1.2 mm long, rounded, truncate, decurrent; leaves mostly basal; blades involute, filiform, rarely flat and up to 2 mm wide, 10-20 cm (4-8") long, hispid above, glabrous to minutely scaberulous below; inflorescence a panicle 7-19 cm (2 3/4-7 2/3") long, narrow, the branches erect with relatively few spikelets; spikelets 1-flowered, large, disarticulating above the glumes; glumes subequal, relatively short, 6.5-9 mm long, acuminate, glabrous or sometimes scaberulous, often purple with hyaline margins and apex, 3-nerved; lemma 4.5-5.7 mm long (including the callus), pale, only slightly indurate, sericeous, with hairs longer at the summit (1-1.5 mm long) than below (0.2-0.5 mm long), the callus often with dense white hairs less than 1 mm long; awn 16-22 mm long, slender, twice-geniculate, the lower segment loosely twisted, scaberulous with hairs about 0.2-0.3 mm long, the terminal segment 7-12 mm long and glabrous; palea about 3.5 mm long, pubescent; lodicules about 1.5 mm long, slender; anthers 1.7-2.5 mm long, purplish; plants of higher precipitation zones (above 14"); June-August.



Stipa lettermanii

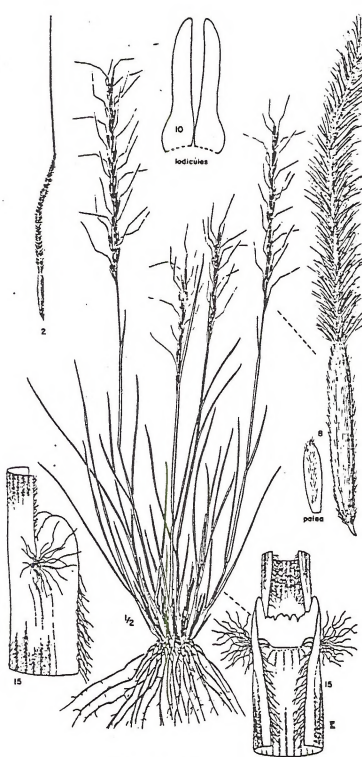
Stipa nevadensis
NEVADA NEEDLEGRASS

Tufted perennials; culms hollow or solid, 2-7 dm (8-28") tall, puberulent below the nodes; sheaths open, glabrous to slightly scaberulous, the throat usually glabrous; leaves mostly basal; ligules short, 0.2-0.7 mm long, truncate, often projecting higher on the sides than in back, erose-ciliolate; blades involute or flat, 1-3 mm broad, often involute towards the tip, 10-25 cm (4-10") long, pubescent above, glabrous below; inflorescence a panicle 6-15 cm (2 3/8-6") long, narrow, the lower branches often enclosed by the upper sheath; spikelet 1-flowered, large, disarticulating above the glumes; glumes subequal, 8-14 mm long, narrow-lanceolate, acuminate, 3-nerved, papery; lemma 5.5-7 mm long (including the callus), more or less indurate, soft pubescent, sometimes with longer hairs at the tip, these averaging about 1.5 mm long, the callus 0.7 mm long, sharp; awn 20-30 mm long, twice geniculate, the lower segments twisted and plumose with hairs averaging about 0.8 mm long, the terminal segment glabrous to short plumose, not twisted; palea 2.8-4.2 mm long; lodicules narrow-elliptic, about 2 mm long; plants of higher precipitation zones (above 12"); June-August.



Stipa occidentalis
WESTERN NEEDLEGRASS

Strongly tufted perennials; culms hollow or solid, 2.5-4 dm (10-16") tall, glabrous to minutely hispid, especially at the nodes; leaves mostly basal; sheaths open, glabrous to hirsute; ligules mostly short, 0.2-0.7 mm long, truncate, sometimes no more than a low crown, often projecting higher on the sides than in back, entire to slightly erose-ciliate, sometimes flanked by tufts of hairs which extend down the margins of the sheath; blades filiform-involute, or rarely flat and up to 2 mm broad, 10-30 cm (4-12") long, puberulent; inflorescence a panicle 10-25 cm (4-10") long, narrow, sometimes rather loose and lax, the branches ascending; spikelets 1-flowered, large, disarticulating above the glumes; glumes subequal, 9-15 mm long, narrow-lanceolate, acuminate 3-nerved, papery; lemma 6-8 mm long (including the callus), more or less indurate, soft pubescent, sometimes with longer hairs at the tip, the hairs 0.2-1.2 mm long, yellowish to pale-brown, the callus 1-1.5 mm long, sharp, usually curved; awn 25-35 mm long, twice geniculate, the lower segments twisted and plumose with hairs 0.5-1.2 mm long, the terminal segment glabrous to short plumose, not twisted; palea 2-3.2 mm long, pubescent; lodicules narrow-elliptic, about 2 mm long; anthers 2.5-4 mm long; plants of higher precipitation zones (above 12") on dry to moderately moist sagebrush slopes; June-August.



Stipa occidentalis

Geniculate - Bent abruptly, as a knee.

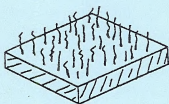


Glabrous - Without hairs.

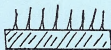
Glaucous - Covered with a whitish or bluish waxy covering that easily wipes off.

Glumes - A pair of bracts (or reduced leaves) at the base of a grass spikelet (See Spikelet).

Hirsute - Rough with coarse or shaggy hairs.

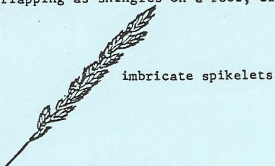


Hispid - Rough with stiff or bristly hairs, hairs usually rigid enough to penetrate skin.



Hyaline - Colorless or translucent, transparent, thin.

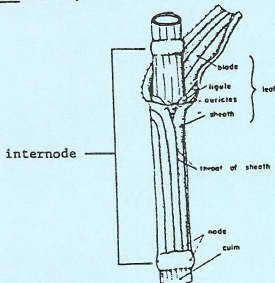
Imbricate - Overlapping as shingles on a roof, either vertically or laterally.



Indurate - Hard or hardened and stiffened.

Inflorescence - The flower cluster of a plant; more correctly, the arrangement of the flowers on an axis.

Internode - The portion of stem between two nodes.



Involute - With the edges rolled inward, toward the upper side.



involute leaf blades

blade involute

Joint - An articulation.

Keel - A prominent dorsal ridge, like the keel of a boat.



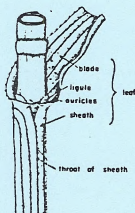
Lacerate - Appearing irregularly cut or cleft, as if torn.

Lanceolate - Lance-shaped; much longer than broad; broadest toward the base and tapering toward the apex.



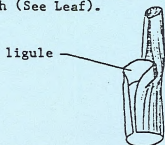
lanceolate ligule

Leaf - In grasses, a structure comprised of a sheath, ligule and blade, auricles may be present or lacking.

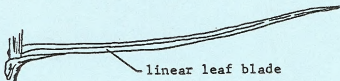


Lemma - The lower of the two bracts immediately enclosing the floret (See Floret).

Ligule - The thin, collar-like appendage on the inside of the blade at the junction with the sheath (See Leaf).



Linear - Long and narrow, of uniform width, i.e., sides parallel.



Lodicules - The 2 or 3 minute hyaline scales at the base of the stamens in grasses, representing the perianth (See Floret).

Medial - Of the middle.

Midrib - The central rib of a leaf or other organ.

Monoecious - Having staminate and pistillate flowers on the same plant but not perfect ones.

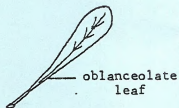
Mucro - A small and short abrupt tip of an organ.



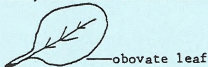
Mucronate - Tipped with a mucro.

Node - The joint of a stem (See Internode).

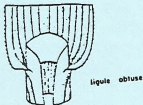
Oblanceolate - Inversely lanceolate; attached at tapered end.



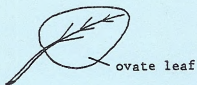
Obovate - Inversely ovate, attached at the narrow end.



Obtuse - Blunt or rounded at the apex.



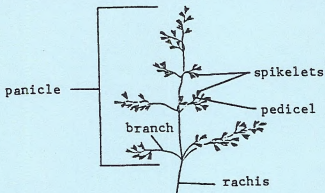
Ovate - With an egg-shaped outline in longitudinal section, the broader end attached.



Ovoid - A solid, or 3-dimensional, ovate figure; solid oval figure.

Palea - The inner bract of a grass floret (See Floret).

Panicle - A compound inflorescence with the younger flowers at the apex or center.



Pedicel - The stalk of a spikelet (See Panicle).

Pedicellate - Having a pedicel, as opposed to sessile.

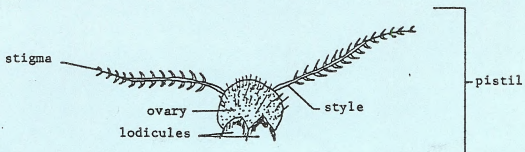
Perennial - A plant lasting for 3 or more years.

Perfect - A flower having both stamens and pistils.

Pilose - With long soft straight hairs.

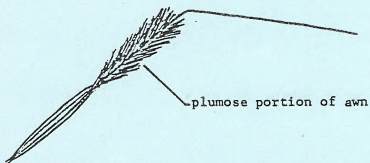


Pistil - The seed-bearing organ of a flower consisting of stigma, style and ovary.

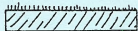


Pistillate - Provided with pistils and without stamens; female.

Plumose - Feathery; having fine hairs on each side as a plume.



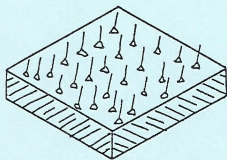
Puberulent - Minutely pubescent.



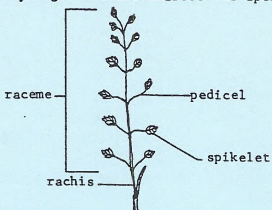
Pubescent - Covered with short, soft hairs; downy.



Pustular - With small busters or pustules mostly at the bases of hairs.



Raceme - An inflorescence with pedicelled flowers borne along an elongated axis with the younger flowers nearest the apex.



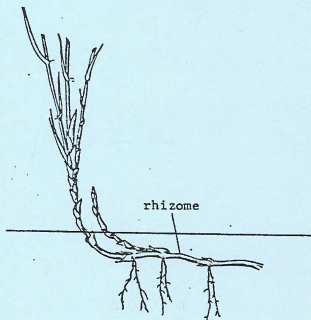
Racemose - Raceme-like or bearing racemes.

Rachilla - The axis of a grass spikelet (See Spikelet).

Rachis - The axis of a spike or raceme (See Raceme).

Reflexed - Abruptly bent downward or backward.

Rhizome - An underground stem or rootstock, with scales at the nodes and producing leafy shoots on the upper side and roots on the lower side.



Rhizomatous - Having rhizomes.

Scabrous - Rough to the touch owing to the structure of the outer surface or to the presence of short stiff hairs.

Scabrid - Somewhat rough.

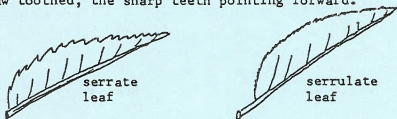
Scaberulous - Minutely roughened.

Scarious - Thin, dry and pliable; membranous; not green.

Sericedus - Silky; clothed with appressed fine, straight hairs.



Serrate - Saw toothed, the sharp teeth pointing forward.



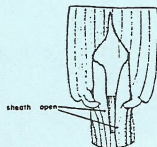
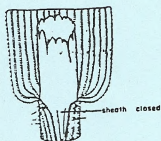
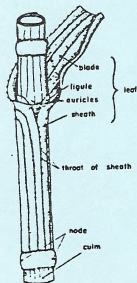
Serrulate - Finely serrate.

Sessile - Attached directly by the base; not stalked.



sessile spikelets

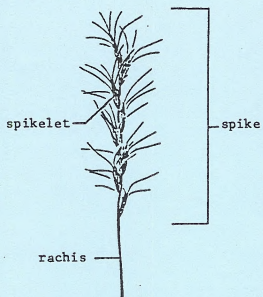
Sheath - The tubular basal part of a grass leaf that encloses the culm (See Leaf).



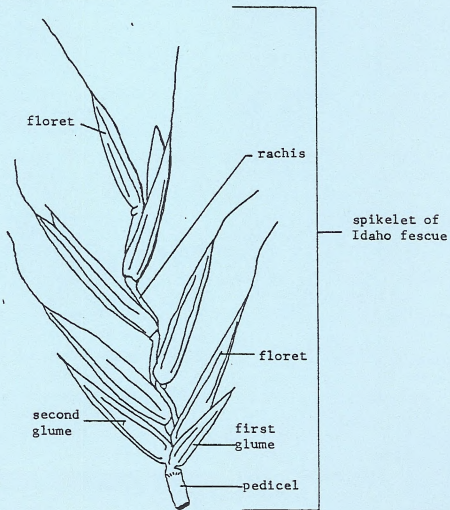
Smooth - Not rough to the touch.

Spicate - Having the form of, or arranged in a spike.

Spike - An elongated rachis of sessile spikelets.



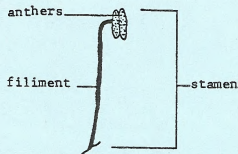
Spikelet - A secondary spike; the ultimate flower-cluster consisting of two glumes and one or more florets.



Spreading - Divergent almost to the horizontal; nearly prostrate.

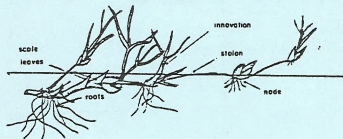
Spreading Hairs - Not at all appressed, erect.

Stamen - The male organ of the flower which bears the pollen; comprised of filament and anther.



Staminate - Having stamens but not pistils; male.

Stolon - A trailing shoot above ground rooting at the nodes.



Stoloniferous - Having stolons.

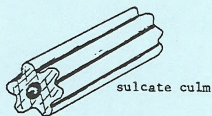
Striate - Marked with fine longitudinal lines, groves, furrows or streaks.

Sub - Latin prefix meaning somewhat or almost.

Subequal - About, almost or somewhat equal.

Subulate - Awl-shaped; narrowly triangular and tapering to a sharp point.

Sulcate - Longitudinally grooved, furrowed or channeled.



Tawny - Dull brownish-yellow.

Terete - Cylindrical; round in cross section.



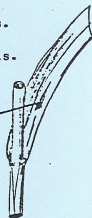
Truncate - As if cut off squarely at the end.



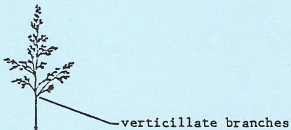
Tufted - Having stems in a very close cluster; having a cluster of hairs.

Ventral - Relating to the inward face of an organ in relation to the axis.

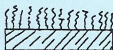
ventral
surface of
leaf blade



Verticillate - Whorled; with 3 or more structures arranged in a circle about a common axis.



Villous - With long, soft, wavy hairs.



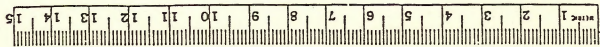
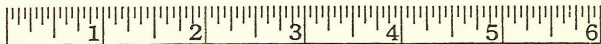
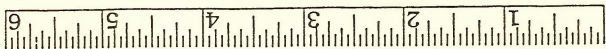
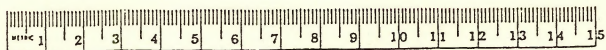
Whorled - A ring of similar organ radiating from a node; verticillate.



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