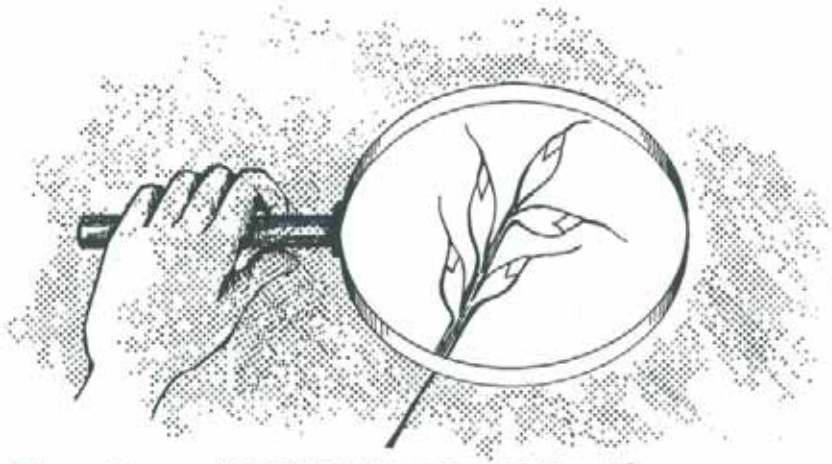
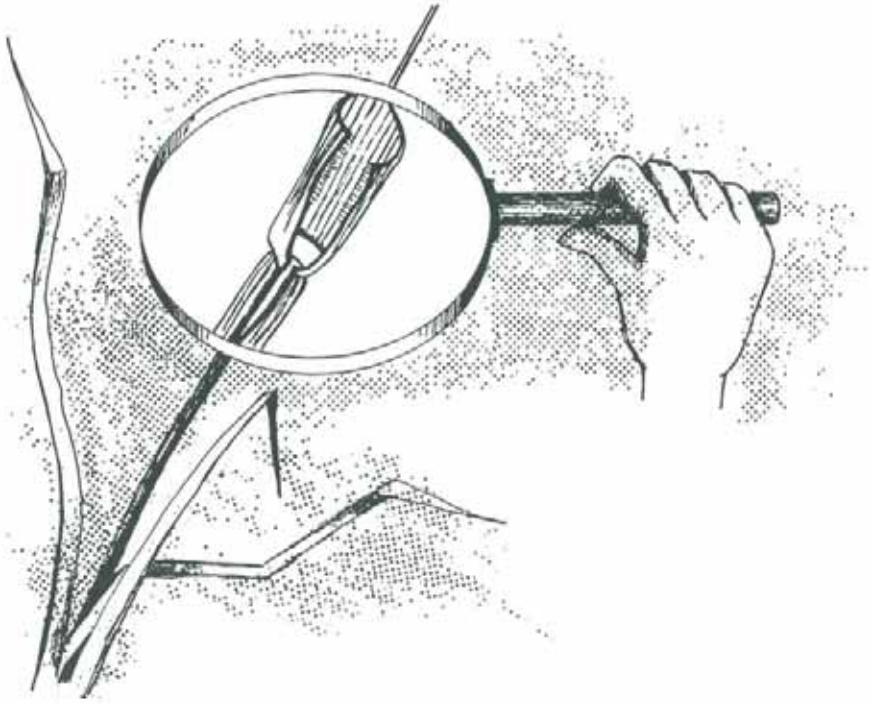


Tips for "GRASS" Identification Using Vegetative Characteristics



Cooperative Extension Service
Montana State University, Bozeman

Circular 1089
Feb. 1975
(Reprint)

The programs of the Montana Cooperative Extension Service are available to all people regardless of race, creed, color, sex or national origin.

Issued in furtherance of cooperative extension work in agriculture and home economics; acts of May 8 and June 30, 1914, in cooperation with the U. S. Department of Agriculture, Carl J. Hoffman, Director, Cooperative Extension Service, Montana State University, Bozeman, Montana 59715.

6/12/77
Robert Blazer
M.S. Range Management

Tips for "Grass" Identification Using Vegetative Characteristics

by

D. E. Ryerson, J. E. Taylor and N. W. Jefferies*

Recognition of range grasses is one of the first steps in good range management. Grasses are most easily recognized when they are "headed out". However, it is necessary to be able to identify the grasses without the seedheads. Grasses in a pre-flowering or in a grazed condition can be identified by their vegetative characters. A knowledge of the soil and moisture requirements of the plants is helpful in their identification.

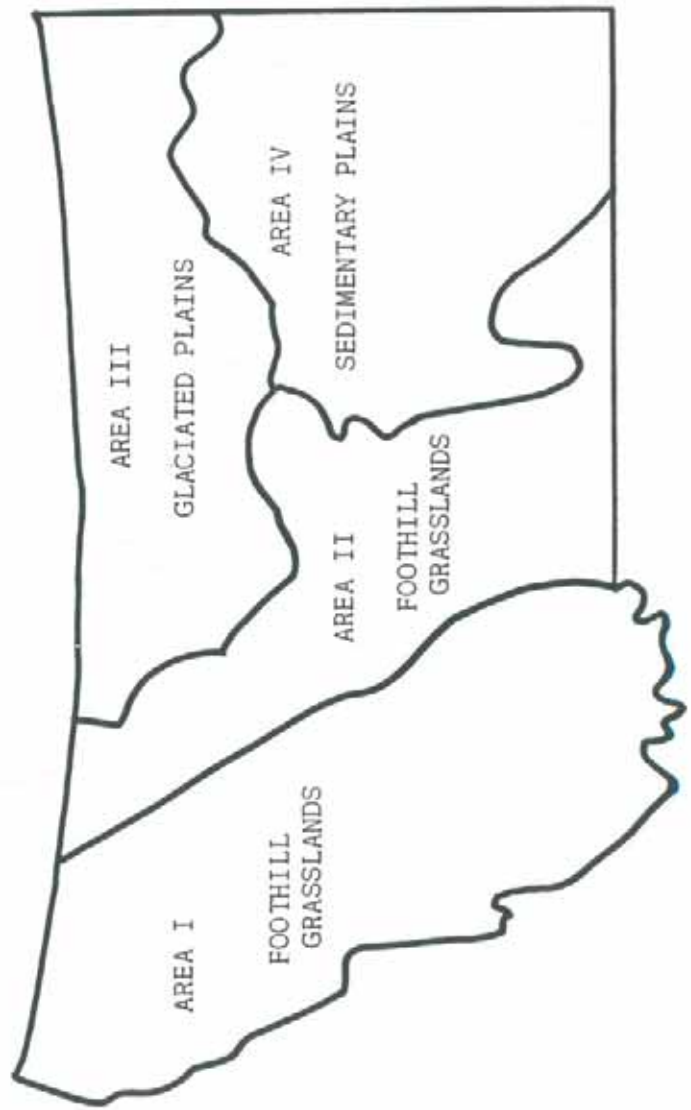
The following key will aid you in identifying 27 common Montana grasses. A key offers you a series of choices leading to the correct plant. Read both descriptions listed under each letter designation (A, AA, etc.) before making a decision. Each decision that you make will lead you to either a plant name or to another set of choices labeled with the next letter of the alphabet. When you feel that you have found the correct plant, read the description given for that plant. Check the vegetative characteristics, the distribution, soil and moisture requirements. A distribution map is given on page 3.

The generalized response of these plants to grazing is also given. Under undisturbed growing conditions, a climax type of vegetation develops. This vegetation is best suited to the soil and moisture characteristics of a particular site. Under grazing the most palatable

*Associate Professor and Assistant Professor, Animal and Range Sciences; Extension Range Specialist, Cooperative Extension Service.

species are grazed closest and most frequently. The palatable species that cannot withstand grazing are reduced in size and number. These plants are called Decreasers. Other climax species then occupy the space vacated by the decreaser species. These plants that increase in number and size under grazing are called Increasers. If the grazing pressure is heavy enough for a period of time, even these plants are weakened. Then plants that normally are not a part of the undisturbed climax vegetation invade the plant communities. These plants are called Invaders.

To aid in recognizing these grasses, sketches of plants and key characteristics have been prepared by Mrs. Elinor Pinczes, Range Technical Aid, and J. E. Taylor, Assistant Professor, Range Science Department.



VEGETATIVE KEY TO COMMON RANGE GRASSES IN MONTANA

A. Perennials

B. Plants spreading by runners; male and female flowers on different plants; found in swales of plains area. 11. Buffalograss *Buchloe dactyloides*

BB. Leaves folded in bud shoot.

C. Ligule a fringe of hairs; leaves erect, stiff, waxy; plants of saline situations, rhizomatous. 14. Inland saltgrass *Distichlis stricta*

CC. Ligule membranous.

D. Dry plains and prairies

E. Blades less than 5 cm. long, twisted wavy, folded; sheat margin pale; densely tufted, with rhizomes. 23. Tumblegrass *Schedonnardus paniculatus*

EE. Blades not wavy; longer than 5 cm.

F. Plants blue-green, densely tufted; blades ridged, fine-hairy, midrib indistinct. 20. Prairie junegrass *Koeleria cristata*

FF. Plants green or whitish, often purple-red; blades smooth, with prominent white midrib. 5. Little bluestem *Andropogon scoparius*

FFF. Plants light green; collar usually indistinct; small compact bunchgrass with prominent ligule. 22. Sandberg bluegrass *Poa secunda*

DD. Foothills and mountains, generally more than 15 inches annual precipitation.

E. Leaves bluish, densely tufted, rolled 5-25 cm. long. 17. Idaho fescue *Festuca idahoensis*

EE. Leaves yellow-green, more than 20 cm. long; large bunchgrass with bright purple base. 18. Rough fescue *Festuca scabrella*

BBB. Leaves rolled in budshoot.

C. Auricles present.

D. Plants with creeping rhizomes.

E. Dry prairies and foothills; leaves usually more than 5 mm. wide.

F. Leaves stiff, grey-blue, prominently ridged. 2. Western wheatgrass *Agropyron smithii*

FF. Leaves less stiff, yellow-green; sometimes tillering vigorously from rhizome nodes. 1. Thickspike wheatgrass *Agropyron dasystachyum*

EE. Open woods, stream bottoms, swales or sandy soils. Leaves more than 5 mm. wide.

F. Ligule obtuse, 2-7 mm. long; very large tufted plants. 16. Basin wildrye *Elymus cinereus*

FF. Ligule truncate, less than 1 mm. long, collar yellowish, blades 3-20 mm. wide. 15. Canada wildrye *Elymus canadensis*

DD. Plants tufted, without long creeping rootstalks.
E. Blades rolling, 1-2 mm. wide; loose bunchgrass of foothills and gravely sites. 3. Bluebunch wheatgrass Agropyron spicatum

EE. Blades flat, 1-3 mm. wide; leaves stiffly ascending; both surfaces and sheaths puberulent.
24. Bottlebrush squirreltail Sitanion hystrix

CC. Auricles absent
D. Ligule a fringe of hairs.
E. Tufted plants with very short rootstalks, sheath round.
F. Sheath margin and collar long-hairy; open sandy sites.
25. Sand dropseed Sporobolus cryptandrus

FF. Sheath margins without hairs.
G. Leaves 1-2 mm. wide, flat or rolling inward when dry, usually hairless, but with sparse long hairs at the collar; forming large patches.
8. Blue grama Bouteloua gracilis

GG. Leaves broader with sparse long hairs on surface and edges.
7. Sideoats grama Bouteloua curtipendula

EE. Plants with long creeping rhizomes. Tufts of hairs on inside of collar margins; sandy soils.
13. Prairie sandreed Calamovilfa longifolia

DD. Ligule membranous, sheaths split.
E. Plants tufted, without creeping rhizomes.
F. Plants of open grassland.
G. Found in sandy areas; very long rolled leaves.
21. Indian ricegrass Oryzopsis hymenoides

GG. Plants of dry or sandy areas.
H. Blades very narrow (less than 2 mm. wide)
6. Red threeawn Aristida longiseta

HH. Blades flat or rolled; 2 mm. or wider.
I. Ligule conspicuous 1-5 mm. long, split.
26. Needleandthread Stipa comata

II. Ligule not conspicuous.
J. Sheath margins long hairy.
27. Green needlegrass Stipa viridula

JJ. Sheath margins hairless.
K. Densely tufted plant of plains and foothills.
3. Bluebunch wheatgrass Agropyron spicatum

KK. Plants of low ground, ligule 1 mm. long, finely ciliate.
4. Slender wheatgrass Agropyron trachycaulum

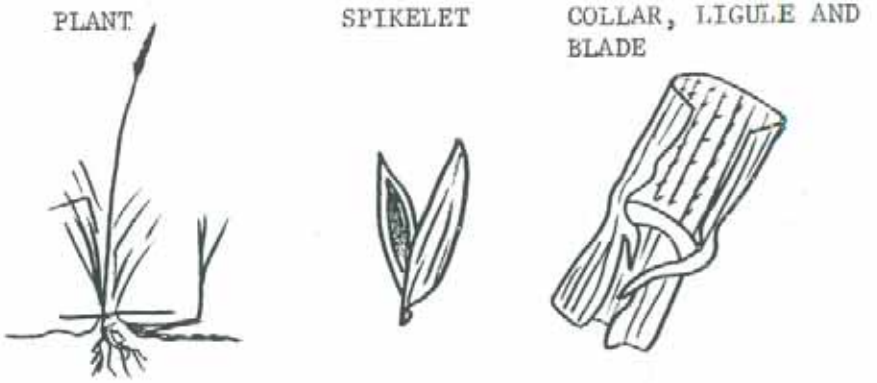
FF. Plants of run-in moisture sites, usually alkaline soils. Leaves light blue-green; blade flat or U-shaped, both sides fine hairy.
19. Foxtail barley
Hordeum jubatum

EE. Plants with creeping rhizomes. Plants of prairie and foothills, rhizomes without scales; blades stiff; ligule conspicuous, 2-6 mm. long.
12. Plains reedgrass
Calamagrostis montanensis

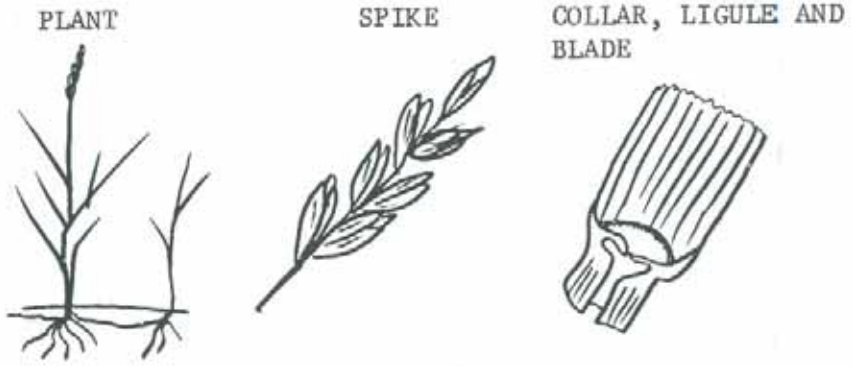
AA. Annuals, sheaths closed, plants of waste or disturbed areas.

B. Blades 2-4 mm. wide, ligule about 1 mm. long, toothed, fringed with silky hairs.
9. Japanese brome
Bromus japonicus

BB. Blades 4-8 mm. wide, hairy; ligule 1-3 mm. long.
10. Cheatgrass brome
Bromus tectorum



1. THICKSPIKE WHEATGRASS, Agropyron dasystachyum. PLANT rhizomatous. SHEATH smooth or slightly rough. AURICLES clawlike and clasping. LIGULE 1 mm long or less. BLADE flat, ridged, slightly rough, bluish-green. DISTRIBUTION - areas 2, 3 and 4, higher mountains in area 1, drier upland areas. SOILS medium to fine textured, well drained. INCREASER.



2. WESTERN WHEATGRASS, Agropyron smithii. PLANT rhizomatous, single stemmed. SHEATH round, rough. AURICLES clawlike and clasping. LIGULE inconspicuous. BLADE flat, prominently veined, very rough upper surface, greenish-blue. DISTRIBUTION - areas 2, 3 and 4; limited in area 1. SOILS medium to fine textured, withstands inundation and siltation. INCREASER.

PLANT

SPIKE

COLLAR, LIGULE AND BLADE

3. BLUEBUNCH WHEATGRASS, Agropyron spicatum. PLANT erect bunchgrass. SHEATH round, stem slender, generally smooth. AURICLES rudimentary, small. LIGULE inconspicuous. BLADE flat, slightly rough. DISTRIBUTION - areas 1, 2, rough breaks and knolls in areas 3 and 4. SOILS, coarse to fine textured, well drained. DECREASER.

PLANT

SPIKE

COLLAR, LIGULE AND BLADE

4. SLENDER WHEATGRASS, Agropyron trachycaulum. PLANT erect bunchgrass. SHEATH round, distinctly veined, smooth. AURICLES clawlike, short. LIGULE inconspicuous. BLADE wide, flat slightly rough. DISTRIBUTION - areas 1, 2, 3 and 4, moist areas and roadsides. SOILS, medium to fine textured, well drained. DECREASER.

PLANT

SPIKELET

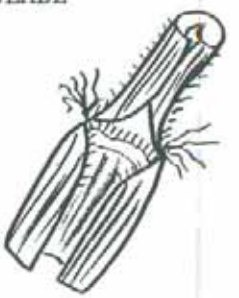
COLLAR, LIGULE AND BLADE

5. LITTLE BLUESTEM, Andropogon scoparius. PLANT densely tufted. SHEATH compressed, flattened at base, base recurved. AURICLES absent. LIGULE, 1-2 mm long, ciliate. BLADE flat to folded, light green and tinged with red. DISTRIBUTION - areas 2, 3, 4; knolls on all slope exposures. SOILS, coarse to medium textured, well drained. DECREASER.

PLANT

SPIKELET

COLLAR, LIGULE AND BLADE



6. RED THREEAWN, Aristida longiseta. PLANT densely tufted bunchgrass. SHEATH round, rough. AURICLES absent. LIGULE reduced to a fringe of hairs and tufts of hairs at collar margins. BLADE narrow, rolled, rough. DISTRIBUTION - areas 1, 2, 3 and 4, slopes, dry plains. SOILS coarse to medium textured, well drained. INCREASER.

PLANT

SPIKELET

COLLAR, LIGULE AND BLADE

7. SIDEOATS GRAMA, Bouteloua curtipendula. PLANT, sod former, short, scaly rhizomes. SHEATH round, short hairs. AURICLES absent. LIGULE short ciliate, appearing as a dense fringe of hairs. BLADE, flat to rolled, twisted hairs along margins and upper surface DISTRIBUTION principally area 4, eastern portion of area 3, dry slopes, rocky hills. SOILS medium to heavy textured. DECREASER.

PLANT

SPIKE

COLLAR, LIGULE AND BLADE

8. BLUE GRAMA, Bouteloua gracilis. PLANT sod former, short scaly rhizomes. SHEATH round, sparsely short hairy. AURICLES absent. LIGULE reduced to a fringe of hairs and short tufted hairs at collar margin. BLADE flat to rolled, twisted, very short hairs upper surface and margins. DISTRIBUTION - areas 2, 3, 4; limited in area 1, dry hills and plains. SOILS medium to fine textured, well drained. INCREASER.

PLANT

SPIKE

COLLAR, LIGULE AND BLADE

9. JAPANESE BROME, Bromus japonicus. PLANT tufted bunchgrass, annual. SHEATH clasped with short open throat, round short hairy. AURICLES absent. LIGULE lacerate with silky hairs. BLADE flat narrow hairy both surfaces. DISTRIBUTION throughout state, more prevalent in areas 3 and 4; disturbed areas and remote places. SOILS, coarse to fine textured. INVADER.

PLANT

SEEDHEAD

COLLAR, LIGULE AND BLADE

10. CHEATGRASS BROME, Bromus tectorum. PLANT tufted bunch, annual. SHEATH closed with open throat, round, short hairy. AURICLES absent. LIGULE coarsely lacerate. BLADE flat, hairy both surfaces. DISTRIBUTION - throughout state, disturbed sites, waste areas. SOILS well drained. INVADER.

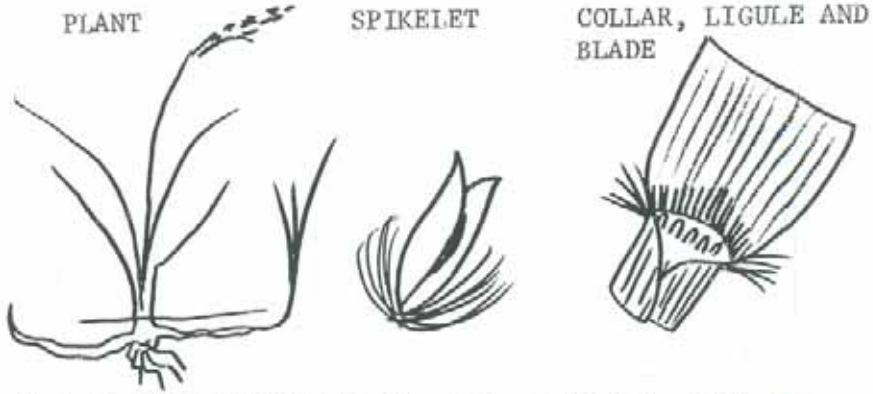
PLANT SPIKELET COLLAR, LIGULE AND BLADE

11. BUFFALOGRASS, Buchloe dactyloides. PLANT sod former with stolons, male and female flowers are separate plants, female flowers borne in axils of the leaves. SHEATH round, smooth. AURICLES absent. LIGULE greatly reduced. LEAF flat, twisted with fine hairs on margins soft to the touch. DISTRIBUTION - areas 3 and 4 eastern portions of the state, swales. SOILS medium to fine textured. INCREASER.

PLANT SPIKELET COLLAR, LIGULE AND BLADE

12. PLAINS REEDGRASS. Calamagrostis montanensis. PLANT sod former, slender rhizomes. SHEATH round prominently veined, smooth. AURICLES absent. LIGULE prominent pointed. BLADE narrow flat to rolled, smooth, green-blue to purplish tinge. DISTRIBUTION - throughout state, moist sites and swales. SOILS medium to fine textured. INCREASER. (Often confused with western wheatgrass).

PLANT SPIKELET COLLAR, LIGULE AND BLADE



13. PRAIRIE SAND REEDGRASS, Calamovilfa longifolia. PLANT tall sod former, thick scaly rhizomes. SHEATH round, smooth, distinct yellowish collar. AURICLES absent. LIGULE fringe of hairs with tufts of hairs at collar margins. BLADE broad flat to rolled, smooth. DISTRIBUTION - throughout state, dry hills. SOILS, coarse to medium texture, loose shales. DECREASER.

PLANT SPIKELET COLLAR, LIGULE AND BLADE

14. SALTGRASS, Distichlis stricta. PLANT sod former, thick scaly rhizomes, male and female plants. SHEATH round, rough. AURICLES absent. LIGULE reduced to a fringe of hairs, tufted hairs at collar margin. BLADE stiff flat to rolled, rough, leaves distinct and ranked. DISTRIBUTION - throughout state, salty and alkaline sites. SOILS heavy textured. INCREASER.

PLANT

DETAIL OF SPIKE

COLLAR, LIGULE AND BLADE

15. CANADA WILDRYE, Elymus canadensis. PLANT tall sparse sod former with short rhizomes. SHEATH round, ciliate margins. AURICLES prominent, clasping. LIGULE lacerate, short ciliate. BLADE wide flat, slightly rough. DISTRIBUTION - throughout state, moist sites, roadsides. SOILS coarse to medium textured. DECREASER.

PLANT

SPIKELET

COLLAR, LIGULE AND BLADE

16. BASIN WILDRYE, Elymus cinereus. PLANT tall erect dense bunchgrass with short thick rhizomes. SHEATH round, smooth to slightly rough. AURICLES prominent clasping. LIGULE prominent, pointed and lacerate. BLADE wide, flat. DISTRIBUTION - areas 1, 2; along major drainages in areas 3 and 4. SOILS medium to heavy textured, salty to well drained. DECREASER.

PLANT

SPIKE

COLLAR, LIGULE AND BLADE

17. IDAHO FESCUE, Festuca idahoensis. PLANT short densely tufted bunchgrass. SHEATH flattened, split only part way down, base pinkish. AURICLES absent. LIGULE indistinct. BLADE fine, rolled, slightly rough, bluish-green to green. DISTRIBUTION - areas 1 and 2; moist slopes, foothills in area 4. SOILS medium to fine textured. INCREASER.

PLANT

SPIKELET

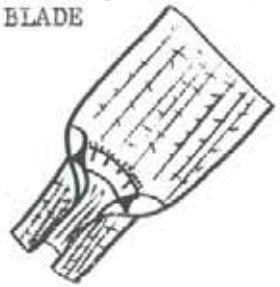
COLLAR, LIGULE AND BLADE

18. ROUGH FESCUE, Festuca scabrella. PLANT longleaved densely tufted bunchgrass. SHEATH, round smooth, base purple. AURICLES absent. LIGULE short, ciliate BLADE long, bristle-like, rough. DISTRIBUTION - areas 1 and 2, moist well drained slopes and uplands. SOILS, medium to fine textured. DECREASER.

PLANT

SPIKELET

COLLAR, LIGULE AND BLADE



19. FOXTAIL BARLEY, Hordeum jubatum. PLANT short tufted bunchgrass. SHEATH round, smooth, slightly short hairy. AURICLES short or absent. LIGULE short, ciliate. BLADE flat or U-shaped, twisted, short hairy upper surface. DISTRIBUTION - throughout state, poorly drained sites and disturbed areas. SOILS medium to fine textured. INVADER.

PLANT

SPIKELET

COLLAR, LIGULE AND BLADE

20. JUNEGRASS, Koeleria cristata. PLANT short tufted bunchgrass. SHEATH round, short hairy, soft to the touch. AURICLES absent. LIGULE short finely ciliate. BLADE flat, prominently veined, short haired has soft or dead feeling. DISTRIBUTION - throughout state, dry hills and plains. SOILS medium to fine textured, well drained. INCREASER.

PLANT

SPIKELET

COLLAR, LIGULE AND BLADE

21. INDIAN RICEGRASS, Oryzopsis hymenoides. PLANT long leaved bunchgrass. SHEATH round, smooth, margin often fringed with hairs. AURICLES absent. LIGULE prominent, pointed, often split. BLADE wide rolled, leathery, prominently veined. DISTRIBUTION - throughout state, dry hills. SOILS, coarse to medium textured, well drained. DECREASER.

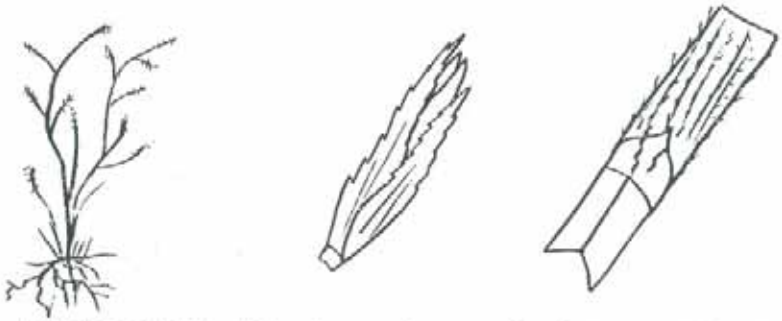
PLANT

SPIKELET

COLLAR, LIGULE AND BLADE

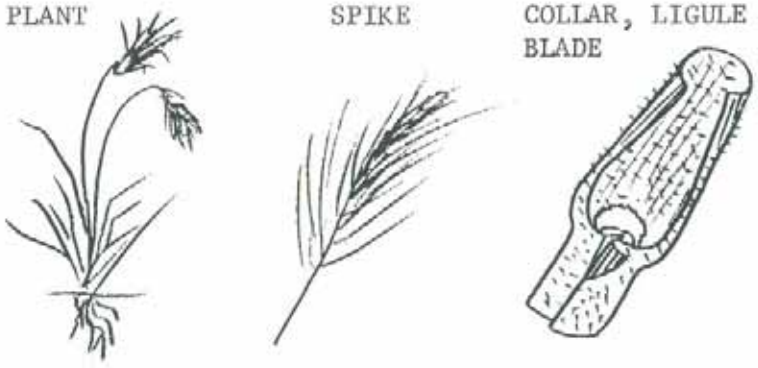
22. SANDBERG BLUEGRASS, Poa secunda. PLANT small tufted bunchgrass. SHEATH slightly compressed, pinkish at base. AURICLES absent. LIGULE prominent pointed, lacerate. BLADE folded, "railroad tracks", boat-shaped tip. DISTRIBUTION - throughout state, dry hills and plains. SOILS coarse to heavy textured. INCREASER.

PLANT SPIKELET COLLAR, LIGULE AND BLADE



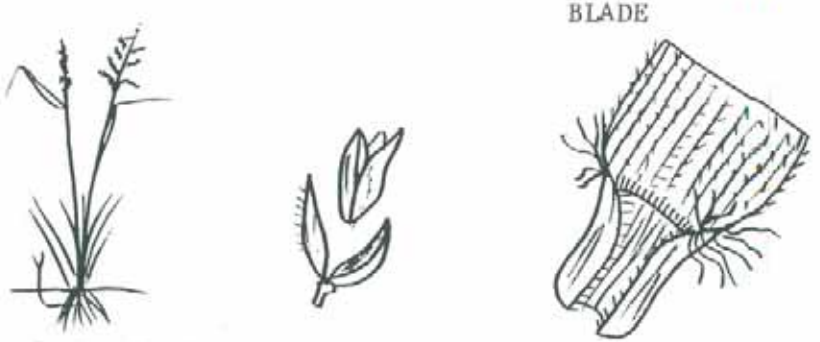
23. TUMBLEGRASS, Schedonnardus paniculatus. PLANT small densely tufted bunchgrass. SHEATH sharply keeled, hyaline margins. AURICLES absent. LIGULE membranous prominent. BLADE narrow, folded, prominent center vein on upper leaf surface, twisted. DISTRIBUTION - throughout state on deteriorated areas. SOILS medium to fine textured, normal to alkaline. INVADER.

PLANT SPIKE COLLAR, LIGULE AND BLADE



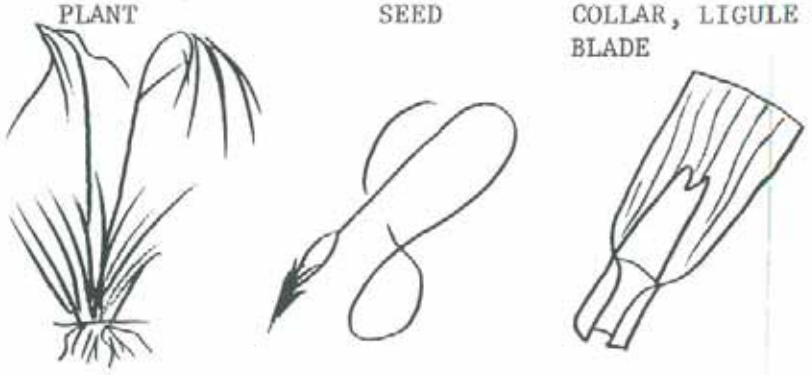
24. SQUIRRELTAIL, Sitanion hystrix. PLANT short densely tufted bunchgrass. SHEATH round, keeled at upper end, indistinctly veined. AURICLES prominent and clawlike. LIGULE small lacerate. LEAF distinctly veined, soft, short fine hairs on surfaces. DISTRIBUTION - throughout state, dry hills plains, river flats in dry areas. SOILS coarse to fine textured; normal to alkaline soils. INCREASER.

PLANT SPIKELET COLLAR, LIGULE AND BLADE



25. SAND DROPSEED, Sporobolus cryptandrus. PLANT short lived tufted bunchgrass with short rhizomes. SHEATH round, split with very short fine hairs on outer margin. AURICLES absent. LIGULE reduced to fringe of hairs with dense tufted hairs at collar margins. DISTRIBUTION - throughout state on dry sandy sites and also on alkaline poorly drained bottoms. SOILS coarse textured sands, sandy loams. INCREASER.

PLANT SEED COLLAR, LIGULE AND BLADE

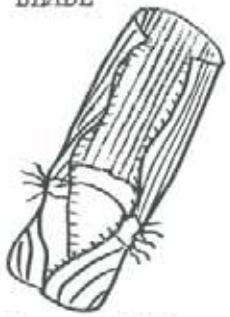


26. NEEDLEANDTHREAD, Stipa comata. PLANT tufted bunchgrass. SHEATH round, smooth prominently veined. AURICLES absent. LIGULE prominent split or frayed. LEAF wide, flat to rolled prominent veined, end of leaf bristle like. DISTRIBUTION - throughout state, dry hills and plains. SOILS coarse to fine textured. INCREASER.

PLANT

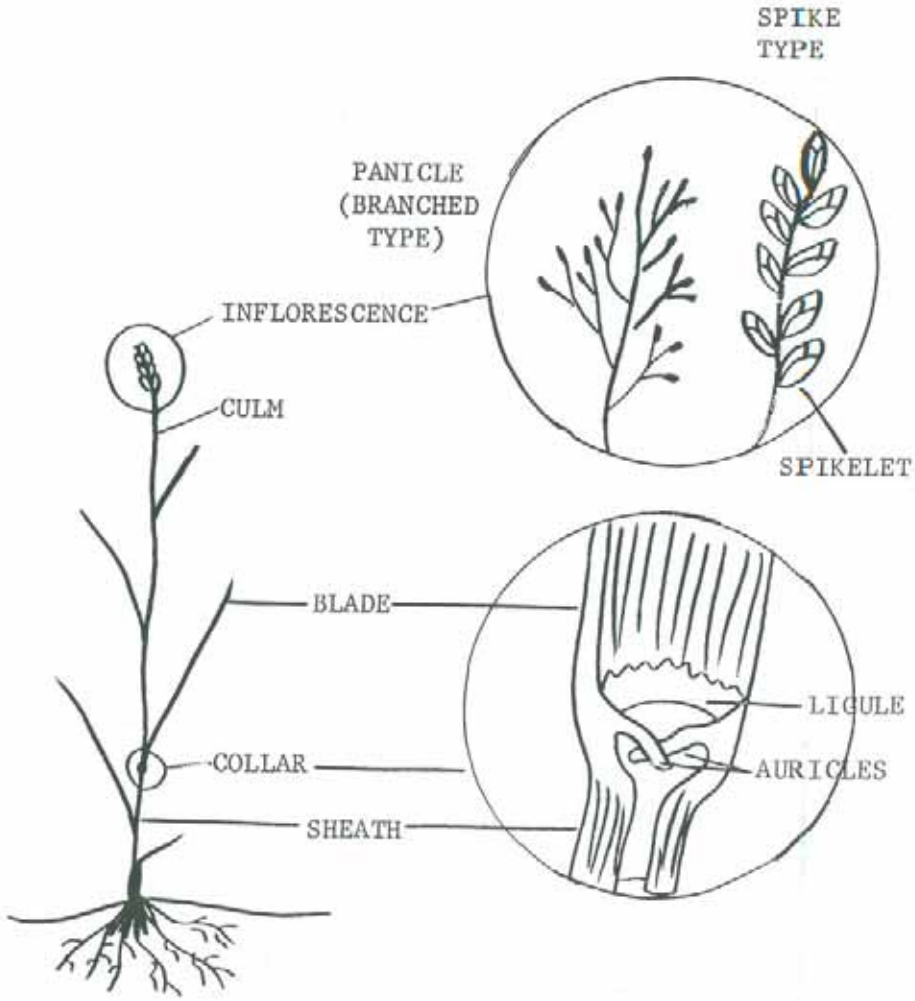
SPIKELET

COLLAR, LIGULE AND BLADE

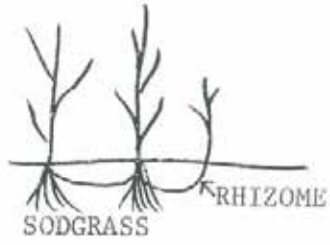


27. GREEN NEEDLEGRASS, Stipa viridula. PLANT erect tufted bunchgrass. SHEATH round. Smooth fine hairs on outer sheath margin. AURICLES absent. LIGULE reduced hairs on outer collar margin. LEAF wide flat to rolled, waxy green appearance. DISTRIBUTION - throughout state, moist areas and swales. SOILS medium to fine textured, well drained. DECREASER.

GRASSES AND THEIR CHARACTERISTICS



BUNCHGRASS



SODGRASS

"SHEATH"

SPLIT

SPLIT, MARGINS OVERLAPPING

CLOSED

"AURICLES"

CLAW-LIKE

ROUNDED

RUDIMENTARY

ABSENT

"LIGULE TYPES"

MEMBRANOUS

FRINGE OF HAIRS

ABSENT

"LIGULE MARGINS"

LACERATE

CILIATE

"COLLAR"

PUBESCENT

CILIATE

GLOSSARY

AURICLES - An ear-shaped appendage or lobe.
CILIATE - Marginally fringed with hairs.
DECREASER - Climax plant which decreases in relative amount under continuous overuse.
INCREASER - Climax plant which increases in relative amount, at least for a time, under heavy use.
INVADER - Plants not found under undisturbed climax conditions that invade a disturbed or overgrazed range.
LIGULE - A small appendage at the juncture of blade and sheath in the leaves of certain families.
OBTUSE - Blunt or rounded at the end.
PUBERULENT - Minutely pubescent with scarcely elongate hairs.
PUBESCENT - Covered with hairs, especially if short, soft and down-like.
RECURVED - Curved back or outward.
RHIZOME - An elongate, horizontal underground stem, a rootstalk.
RUDIMENTARY - An imperfectly developed and functionally useless organ, a vestige.
TRUNCATE - Ending abruptly, as if cut off transversely.

SELECTED REFERENCES

Booth, W. E., Flora of Montana Part I, Conifers and Monocots. Montana State University. 1950.

Clarke, S. E., J. A. Campbell, and W. Shevkenek, The Identification of Certain Native and Naturalized Grasses by Their Vegetative Characters. Canada Dept. of Agric. Tech. Bull. 50. 1950.

Grass. North Dakota Agricultural College Bulletin 400. 1941.

Harrington, H. E. and L. W. Durrell. Key to Some Colorado Grasses in Vegetative Conditions. Colorado Agr. Expt. Sta., Colorado State College, Ft. Collins. Tech. Bull. 33. 1944.

May, Morton. Key to the Major Grasses of the Big Horn Mountains. University of Wyoming. Bull. 371. 1960.

Morris, H. E., W. E. Booth, G. F. Payne and R. E. Stitt. Important Grasses on Montana Ranges. Montana State University Bull. 500.

INDEX

	Page
Introduction	1
Map of Montana by Areas	3
Vegetative Key to Common Range Grasses of Montana	4-8
Plant Identification	
Agropyron dasystachyum - Thickspike wheatgrass	9
Agropyron smithii - Western wheatgrass	9
Agropyron spicatum - Bluebunch wheatgrass	10
Agropyron trachycaulum - Slender wheatgrass	10
Andropogon scoparius - Little bluestem	11
Aristida longiseta - Red threeawn	11
Bouteloua curtipendula - Sideoats grama	12
Bouteloua gracilis - Blue grama	12
Bromus japonicus - Japanese brome	13
Bromus tectorum - Cheatgrass grome	13
Buchloe dactyloides - Buffalograss	14
Calamagrostis montanesis - Plains reedgrass	14
Calamovilfa longifolia - Prairie sandreedgrass	15
Distichlis stricta - Saltgrass	15
Elymus canadensis - Canada wildrye	16
Elymus cinerus - Basin wildrye	16
Festuca idahoensis - Idaho fescue	17
Festuca scabrella - Rough fescue	17
Hordeum jubatum - Foxtail barley	18
Koeleria cristata - Junegrass	18
Oryzopsis hymenoides - Indian ricegrass	19
Poa secunda - Sandberg bluegrass	19
Schedonnardus paniculatus - Tumblegrass	20
Sitanion hystrix - Squirreltail	20
Sporobulus cryptandrus - Sand dropseed	21
Stipa comata - Needleandthread	21
Stipa viridula - Green needlegrass	22
Illustrations	
Grasses and their Characteristics	23
Sheath and Auricle	24
Ligule Types, Ligule Margins and Collars	25
Glossary	26
Selected References	27