

Identifying grasses in Wisconsin turf

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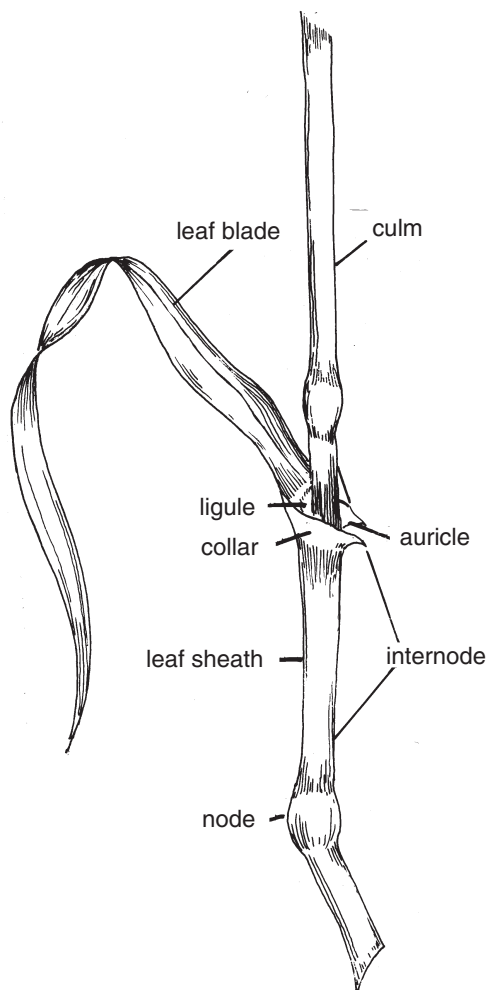


Figure 1. Parts of an elongated stem of grass

Grasses differ in many small ways—this makes identification difficult. About 190 species of grasses belonging to 64 genera (groups of closely related species) grow in Wisconsin.

This publication will help you identify the 30 most important grass species in Wisconsin turf. It includes grasses that commonly belong in turf, and those sometimes growing as weeds in turf. All grasses are identified in their vegetative stage of development.

Terminology

To identify grasses, you need to know the different parts of the grass plant (figures 1 and 2). You also need to master the technical terms that define exact parts and features of grasses. Using this terminology avoids long and repetitive descriptions. The descriptive terms are defined in the glossary at the end of this publication.

Equipment

The following is a list of items you will need to help you identify grasses:

1. Hand lens (magnification of 8–10X)—Lower-power magnifying glasses are not strong enough, and hand lenses more powerful than 10X are hard to use because of their short focal lengths.
2. Metric ruler—Measurements are always given in millimeters and centimeters in technical treatments.
3. Piece of balsa wood or a large cork (cut in half)—Holds grass to make even cut for examining cross-sections of plant parts.
4. Single-edge razor blade—Used to make cross-sections of the plant parts.
5. One or two ordinary steel needles mounted in pieces of wood—Needles are mounted in wood for easy handling. They help open or unfold certain structures for examination.

Identification technique

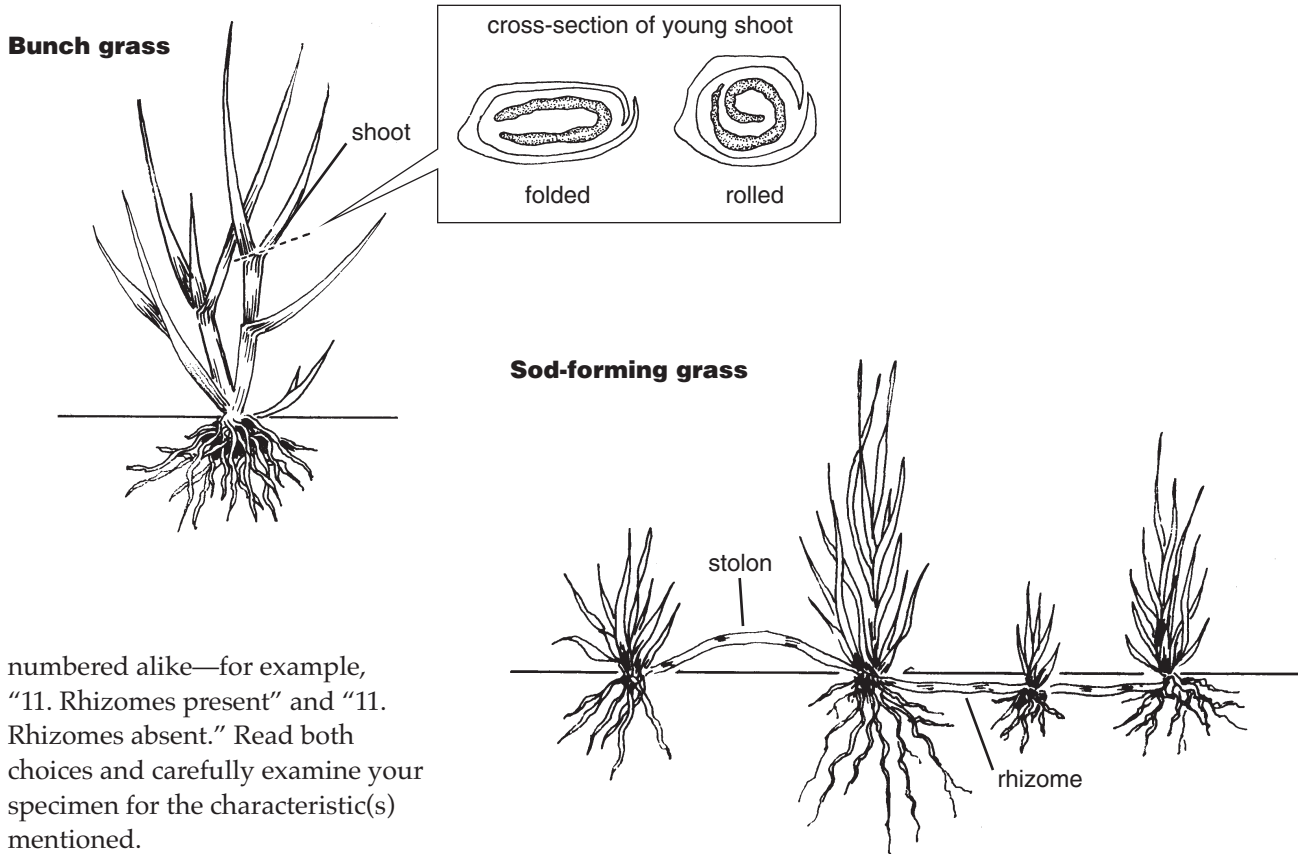
To identify a grass specimen, remove a part of the plant from the turf. First, determine if it is annual or perennial—annuals have many fine roots; perennials have coarser, deeper roots, and often have underground stems or rhizomes.

Then examine the leaves and sheaths with the hand lens and note if sheaths are open or closed. Examine the ligule and the collar, and check for auricles, especially on younger shoots.

Next, take a young shoot and place it between the halves of the cork. Cut the shoot off evenly with the flat cork surface. Examine the cut surface with the hand lens to see if the young shoot has leaves folded or rolled.

When you have finished your general examination of the plant specimen, use the key on page 3 to identify it. The key is arranged so there are two choices for each observation. These choices are

Figure 2. A comparison of sod-forming and bunch grass. The bunch grass has unelongated stems called shoots. To determine vernation (rolled or folded), you would cut at the dotted slash.



numbered alike—for example, “11. Rhizomes present” and “11. Rhizomes absent.” Read both choices and carefully examine your specimen for the characteristic(s) mentioned.

For example, suppose that your specimen has no hairs at the ligule (or a very few short ones), no auricles on young leaves, sheaths open to near the base, and a culm that is swollen at the base.

To identify this plant you would select the second “1.” (“Hairs usually not present on ligule margin or, if present, less than half the ligule length”), the second “10.” (“Auricles absent on young leaves”), the second “14.” (“Sheaths of older shoots open to near base or node”), and the first “16.” (“Base of culm swollen or bulbous; ligule less than 2 mm long”). The specimen is timothy.

Now refer to drawing 15 of figure 3 (page 6) to see if the cross-section of the shoot fits the drawing. If so, then turn to the short, abbreviated description of timothy in the section on “Species Descriptions” (page 10). If your specimen agrees with the characteristics described for timothy, the identification is correct. If not, you made a mistake and will have to start over.

Sometimes, grasses may fit both choices of the key. If you choose the wrong alternative, a later choice will set you straight. You may need to “start over” several times before you make the correct identification.

Key to grasses in Wisconsin turf^a

For turf and weedy grasses in vegetative stages of development

NOTE: *Festuca rubra* (red fescue), *Setaria viridis* (green foxtail), and *Setaria verticillata* (bristly foxtail) appear in the key twice because each varies in a definitive characteristic.

Key to initials in parentheses:

(F) = forage species; (HD) = heavy-duty turf; (T) = turf; (W) = weedy species. The number following the grass name indicates the corresponding drawing to refer to in figure 3 (pages 6 and 7).

^aAdapted from Colorado Turfgrasses (Colo. St. Univ. Ext. Serv. Circ. 201-A, 1959) by J.L. Fults.

- 1. Hairs present on half or more of the ligule length
 - 2. Hairs on sheath or lower leaf margin papillose; midnerve enlarged, white, and prominent *Panicum capillare*/Tickle grass (W) #1
 - 2. Hairs on sheath or lower leaf margin, if present, not papillose; midnerve not enlarged, white, and prominent
 - 3. Raised circular glands present on leaf margins and midnerves of blade; leaves have pungent odor *Eragrostis cilianensis*/Stinkgrass (W) #2
 - 3. Circular glands not present; leaves without pungent odor
 - 4. Mature leaf blades more than 3.5 mm wide (collar and/or sheath hairy)
 - 5. Sheath with a conspicuous tuft of long white hairs at summit; annual or perennial
 - 6. Plant annual; without rhizomes; branching from the base *Sporobolus vaginiflorus*/Dropseed (W)
 - 6. Plant perennial; with or without rhizomes *Sporobolus cryptandrus*/Sand dropseed (W) #3
 - 5. Sheath without a conspicuous tuft of long white hairs at summit
 - 7. Sheath smooth and collar hairy *Setaria viridis*/Green foxtail (W) #4
 - 7. Sheath and collar not hairy
 - 8. Sheath compressed or keeled in cross-section *Setaria verticillata*/Bristly foxtail (W) #5
 - 8. Sheath oval, sharply keeled in cross-section *Setaria lutescens*/Yellow foxtail (W) #6
 - 4. Mature leaf blades less than 3.5 mm wide
 - 9. Culms erect, closely tufted; sheaths pilose at least on margin; long pilose at throat; blades pilose above near base *Eragrostis capillaris*/Lacegrass (W)
 - 9. Culms spreading or decumbent at base; sheaths glabrous except at pilose base; blades glabrous *Eragrostis frankii*/Frank's lovegrass (W)
1. Hairs usually not present on ligule margin or, if present, less than half the ligule length
 - 10. Auricles usually present on young leaves
 - 11. Rhizomes present; leaves 6 mm or more wide; nerves on upper leaf surface not prominent; leaf has soft texture *Agropyron repens*/Quackgrass (W) #7
 - 11. Rhizomes absent
 - 12. Leaf margins smooth *Lolium perenne*/Perennial ryegrass (T) #8
 - *Lolium multiflorum*/Italian ryegrass (T) #9
 - 12. Leaf margins rough
 - 13. Auricles without marginal hairs *Festuca elatior*/Meadow fescue (F) #10
 - 13. Auricles with a few marginal hairs; foliage dark green; leaves tough and fibrous *Festuca arundinacea*/Tall fescue (F, HD) #11
 - 10. Auricles absent on young leaves
 - 14. Sheaths of older shoots closed at least half their length to the node
 - 15. Leaves folded in buds; leaf edges do not overlap in buds; sheaths flattened; ligule prominent; perennial *Dactylis glomerata*/Orchardgrass (F) #12
 - 15. Leaves rolled in buds; edges of leaf blades overlap in bud; ligule not prominent; annual *Bromus japonicus*/Japanese chess (W) #13
 - *Bromus tectorum* /Downy brome (W) #14
 - 14. Sheaths of older shoots open to near base or node
 - 16. Base of culm swollen or bulbous; ligule less than 2 mm long *Phleum pratense*/Timothy (F) #15
 - 16. Base of culm not swollen or bulbous; ligule less than 2 mm long

- 17. Rhizomes present, sometimes weakly developed
 - 18. Leaves folded in bud; edges of blade do not overlap in bud
 - 19. Sheaths and culms strongly compressed and keeled *Poa compressa*/Canada bluegrass (T) #16
 - 19. Sheaths and culms not strongly compressed and keeled
 - 20. Bases of culms not red or fibrillose; leaves not boat-shaped and rounded at tip . . . *Festuca rubra*/Red fescue (T) #17
 - 20. Bases of culms not red or fibrillose; leaves boat-shaped and rounded at tip . . . *Poa pratensis*/Kentucky bluegrass (T,F) #18
 - 18. Leaves rolled in buds; edges of bud blades overlap
 - 21. Mature leaves approach or exceed 6 mm in width; ligule may be up to 4 mm wide, acute at tip; lower margins of blades strongly barbed. *Agrostis alba*/Redtop (F,T) #19
 - 21. Mature leaves usually 3 mm wide or less; margins of leaves not strongly barbed
 - 22. Forms tufts by thin rhizomes; thatches readily *Agrostis tenuis*/Bentgrass (T) #20
 - 22. Does not form tufts; spreads by thin stolons near ground level *Agrostis palustris*/Bentgrass (T) #21
- 17. Rhizomes not present
 - 23. Annual grass
 - 24. Ligules with long ciliate hairs (not more than 3 mm) at least one-fourth the ligule length
 - 25. Sheaths keeled or compressed; lower collar edge smooth *Setaria verticillata*/Bristly foxtail (W) #5
 - 25. Sheaths not keeled or only slightly compressed; lower collar edge has pilose hair *Setaria viridis*/Green foxtail (W) #4
 - 24. Ligule without long ciliate hairs; may be entire or minutely toothed
 - 26. Long hairs on collar edge; longer than those of blade and sheath
 - 27. Sheaths smooth; old seed attached to roots of small seedlings (2 mm long), usually dark brown seed . . . *Digitaria ischaemum*/Smooth crabgrass (W) #22
 - 27. Sheaths pubescent or pilose; old seed of small seedlings (3 mm long) usually light brown *Digitaria sanguinalis*/Hairy crabgrass (W) #23
 - 26. Long hairs not present on collar; ligules more than 1 mm long, rounded or acute *Poa annua*/Annual bluegrass (W) #24
 - 23. Perennial grass
 - 28. Leaves folded in bud, edges of leaf blade in bud do not overlap
 - 29. Sheaths retrorsely scabrous; ligule acute at tip or center . . . *Poa trivialis*/Rough stalk meadow grass (T) #25
 - 29. Sheaths not retrorsely scabrous; ligule depressed in center
 - 30. Culms bent or decumbent at base, red and fibrillose; leaves green, 1.5–2.5 mm wide . . *Festuca rubra*/Red fescue (T) #17
 - 30. Culm erect, not red or fibrillose; leaves bluish-green, 1–1.5 mm wide . . . *Festuca ovina*/Sheep fescue (T) #26
 - 28. Leaves rolled in bud, edges of leaf bud overlap; sheaths strongly compressed and often root at nodes to form dense colonies . . . *Muhlenbergia schreberi*/Nimblewill (W) #27

Species descriptions^a

Species identified in the key are described below. Check the glossary (page 11) for the meaning of technical terms. Also see figure 3 for the specific drawings indicated for each grass species.

***Agropyron repens*— Quackgrass (7)**

Habit: perennial, rhizomatic.
Vernation: rolled.
Sheath: round, split, pubescent to pilose below.
Collar: conspicuous, pubescent both sides, whitish to purplish, V-shaped, divided, oblique.
Ligule: 0.5–1 mm, collar-shaped, margins short-ciliate.
Auricle: 1 mm.
Blade: 4–10 mm x 8–20 cm, margins sometimes slightly barbed.

***Agrostis alba*—Redtop (19)**

Habit: perennial, somewhat tufted or short rhizomatic.
Vernation: rolled.
Sheath: oval, somewhat keeled, split, glabrous.
Collar: conspicuous, glabrous, pale green, V-shaped, oblique.
Ligule: somewhat variable to 4 mm, margins less toothed, slightly pubescent on back.
Auricle: none.
Blade: 3–8 mm x 4–15 cm, margins somewhat barbed.

***Agrostis palustris*— Bentgrass (21)**

Similar to *Agrostis alba* (redtop) but with long stolons and narrow, stiff appressed leaves. (Creeping, Coos Bay, Metropolitan, and Washington bents of this species)

***Agrostis tenuis*—Bentgrass (20)**

Habit: perennial, short rhizomatic and somewhat tufted.
Vernation: rolled.
Sheath: longer than internodes on vegetative shoots, split with hyaline margins overlapping, glabrous, greenish-purplish.
Collar: conspicuous, narrow, glabrous, light green, somewhat divided, oblique.
Ligule: 0.3–1.2 mm, collar-shaped, entire to finely toothed.
Auricle: none.
Blade: 1.5–3.5 mm x 2–10 cm, truncate base, sharp-pointed, margins inrolled at tip, margins and upper surface scabrous. (Colonial, Rhode Island, Highland, forms of Prince Edward Island, New Zealand, and Astoria bents of this species)

***Bromus japonicus*—Japanese brome, Japanese chess (13)**

Habit: annual, tufted.
Vernation: rolled.
Sheath: round, somewhat keeled near collar, mostly closed, pubescent to pilose.

Collar: pubescent, pale, narrow.
Ligule: 2–3 mm, rounded, margins with long sharp teeth.
Auricle: none.
Blade: 3–7 mm x 5–12 cm, pubescent.

***Bromus tectorum*—Downy brome, downy chess (14)**

Similar to *Bromus japonicus* (Japanese brome, Japanese chess).

***Dactylis glomerata*— Orchardgrass (12)**

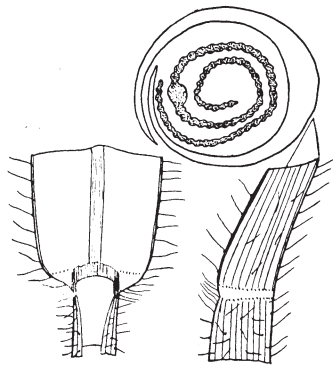
Habit: perennial, tufted.
Vernation: folded.
Sheath: compressed, keeled, glabrous, mostly closed.
Collar: broad, conspicuous, glabrous.
Ligule: 2–8 mm, white, lacerate and truncate.
Auricle: none.
Blade: 2–12 mm x 10–40 cm, V-shaped, acute tips, sometimes glaucous, margins somewhat scabrous.

***Digitaria ischaemum*— Smooth crabgrass (22)**

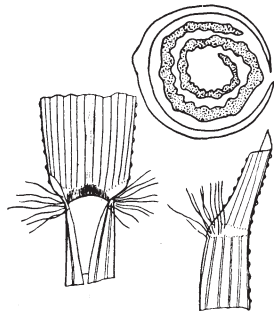
Habit: annual, low and somewhat prostrate.
Vernation: rolled.
Sheath: compressed near collar, split, somewhat hairy at base, pinkish-purplish margins hyaline and overlapping.
Collar: pilose on margins, often divided.
Ligule: 2–3 mm, obtuse to truncate, somewhat divided, margins undulate.
Auricle: none.
Blade: 2–6 mm x 2–10 cm, somewhat cordate at base which may be hairy, sharp tipped, dull-green to purplish, somewhat scabrous, and margins smooth to scabrous.

^aMuch of the information in the species descriptions was drawn from Colorado Turfgrasses (Colo. St. Univ. Ext. Serv. Circ. 201-A. 1959) by J.L. Fults; The Identification of Certain Native and Naturalized Hay and Pasture Grasses by Their Vegetative Characters (MacDonald College Tech. Bull. 16. 1936) by F.S. Nowosad, D.E.N. Swales, and W.G. Dore; and Key to Some Colorado Grasses in Vegetative Condition (Colo. Agric. Experiment Stn. Tech. Bull. 33. 1944) by H.D. Harrington and L.W. Darrell. Other useful references include: Grasses in Wisconsin (Univ. Wis. Press 1951) by N.C. Fassett; and Manual of Grasses of the United States (U.S. Govt. Printing Office, Washington, D.C., Misc. Pub. 22, Rev. ed., 1950) by A.S. Hitchcock.

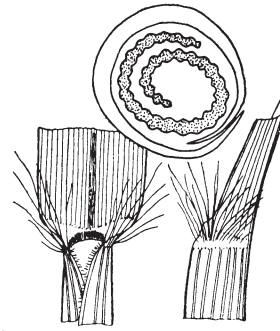
Figure 3. Cross-sections of shoots of various grass species^a



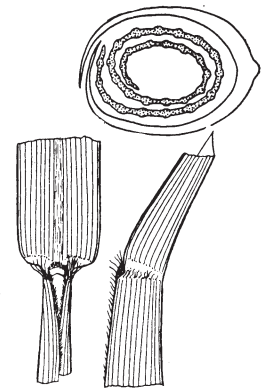
1. *Panicum capillare*



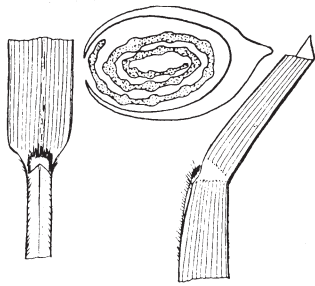
2. *Eragrostis cilianensis*



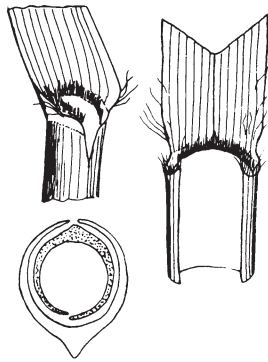
3. *Sporobolus cryptandrus*



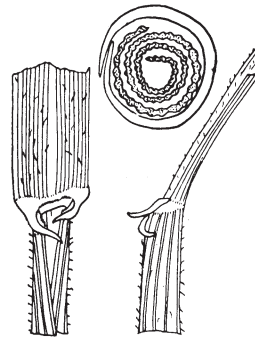
4. *Setaria viridis*



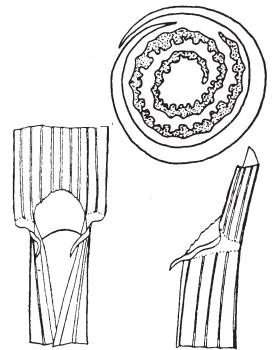
5. *Setaria verticillata*



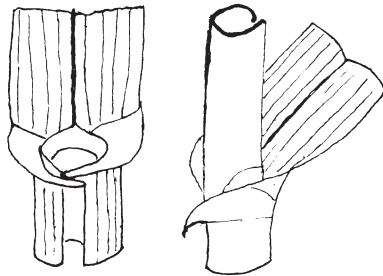
6. *Setaria lutescens*



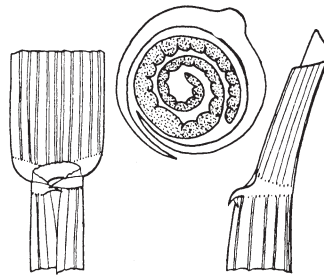
7. *Agropyron repens*



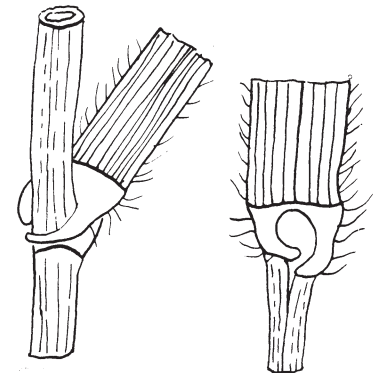
8. *Lolium perenne*



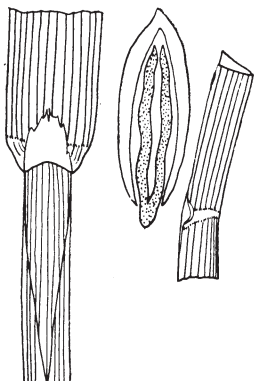
9. *Lolium multiflorum*



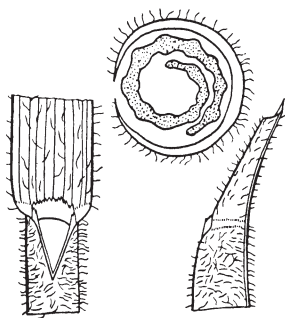
10. *Festuca elatior*



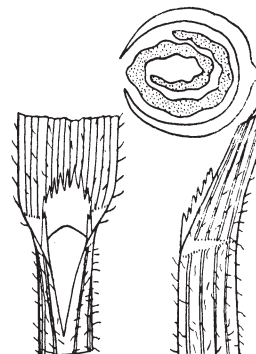
11. *Festuca arundinacea*



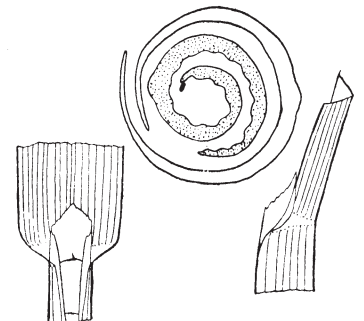
12. *Dactylis glomerata*



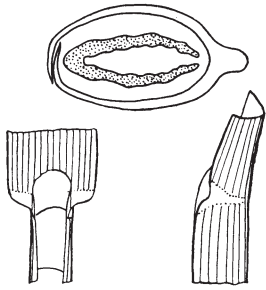
13. *Bromus japonicus*



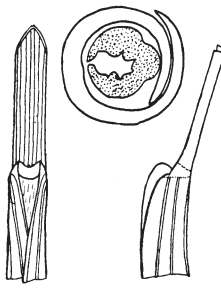
14. *Bromus tectorum*



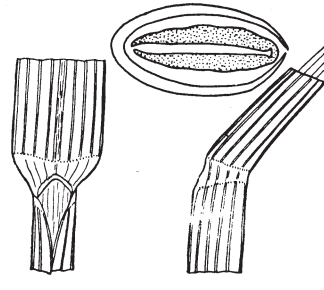
15. *Phleum pratense*



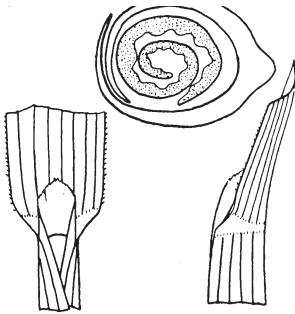
16. *Poa compressa*



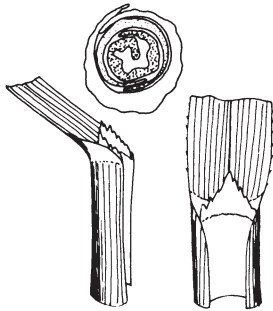
17. *Festuca rubra*



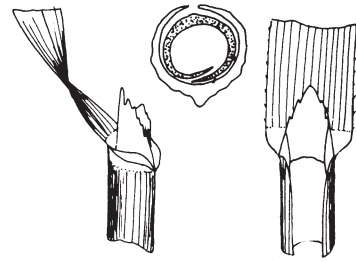
18. *Poa pratensis*



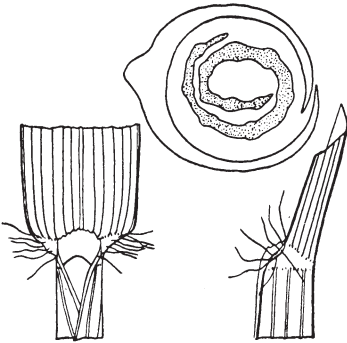
19. *Agrostis alba*



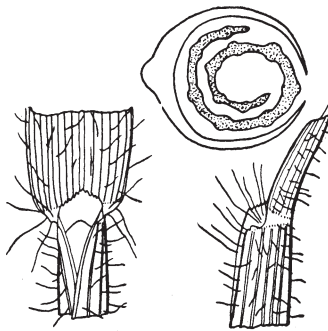
20. *Agrostis tenuis*



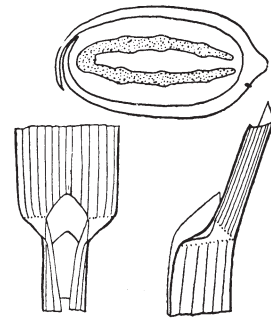
21. *Agrostis palustris*



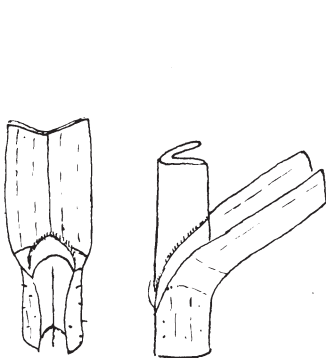
22. *Digitaria ischaemum*



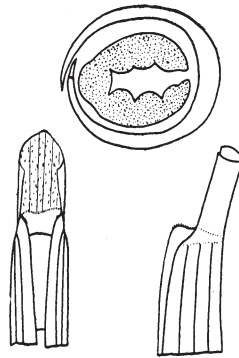
23. *Digitaria sanguinalis*



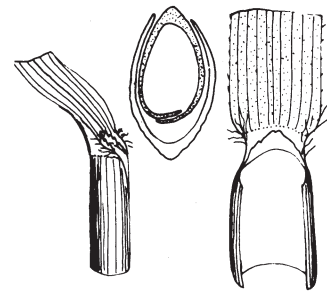
24. *Poa annua*



25. *Poa trivialis*



26. *Festuca ovina*



27. *Muhlenbergia schreberi*

^aAll drawings except 9 and 25 are reproduced from Colorado Turfgrasses (Colo. St. Univ. Ext. Serv. Circ. 201-A. 1959) by J.L. Fults. These two figures are redrawn from The Identification of Certain Native and Naturalized Hay and Pasture Grasses by Their Vegetative Characters (MacDonald College Tech. Bull. 16. 1936) by F.S. Nowosad, D.E.N. Swales, and W.G. Dore.

***Digitaria sanguinalis*—Hairy crabgrass, large crabgrass (23)**

Habit: annual, low, somewhat prostrate and rooting at nodes.
 Vernation: rolled.
 Sheath: oval or somewhat compressed, somewhat keeled near collar, split margins hyaline.
 Collar: broad, conspicuously divided by midrib, long pilose above.
 Ligule: 0.5–2 mm, acute to rounded at center, undulate, sometimes reddish.
 Auricle: none.
 Blade: 3–10 mm x 5–15 cm, soft, sharp-tipped, pilose on both surfaces, margins scabrous.

***Eragrostis capillaris*—Lacegrass**

Habit: annual, tufted, often ascending.
 Vernation: rolled.
 Sheath: pilose, long pilose at throat, split, overlapping.
 Collar: rather broad, only moderately conspicuous, glabrous, long pilose at margin.
 Ligule: about 5 mm, collar-shaped, hairs.
 Auricle: none or long ciliate.
 Blade: 2–4 mm x 7–25 cm, pilose above near base, long pilose on margins of some plants.

***Eragrostis cilianensis*—Stinkgrass (2)**

Habit: annual, tufted.
 Vernation: rolled.
 Sheath: somewhat round, somewhat keeled, split, glabrous.
 Collar: long, pilose above and on sides near margins.
 Ligule: 0.5 mm, collar-shaped, entire of hairs.
 Auricle: none.
 Blade: 2–7 mm x 6–25 cm, margins papillose near collar (origin of strong odor) and often inrolled.

***Eragrostis frankii*—Frank's lovegrass**

Habit: annual, tufted, spreading to erect.
 Vernation: rolled.
 Sheath: round, glabrous except pilose on margins toward throat, split.
 Collar: constricted above, moderately conspicuous, glabrous with long pilose hairs at margin, sometimes reddish purple.
 Ligule: 1–3 mm, all hairs.
 Auricle: none or long ciliate or pilose.
 Blade: 2–4 mm x 5–13 cm, scabrous above, sharp-tipped.

***Festuca arundinacea*—Tall fescue (11)**

Habit: perennial, tufted.
 Vernation: rolled.
 Sheath: round, but keeled near top, split, glabrous.
 Collar: conspicuous, green-yellow.
 Ligule: few marginal hairs.
 Auricle: none or rounded.
 Blade: 6–12 mm x 30–60 cm, margins scabrous, midrib prominent, tips sharp, course and tough.

***Festuca elatior*—Meadow fescue (10)**

Habit: perennial, tufted.
 Vernation: rolled.
 Sheath: round, glabrous, pale green to reddish purple at base, somewhat split entire length, overlapping hyaline margins.
 Collar: broad, conspicuously glabrous, pale yellow to yellow-green, margins thin, swollen and somewhat wavy.
 Ligule: 0.4–0.7 mm, collar-shaped, irregular margin, very short teeth, greenish, truncate or obtuse.

Auricle: 0.5–1.5 mm, no marginal hairs, soft claw-like or blunt, pale yellow to yellow-green.
 Blade: 3–8 mm x 10–50 cm, bright green, dull above, scabrous margins.

***Festuca ovina*—Sheep fescue (26)**

Habit: perennial, tufted.
 Vernation: folded.
 Sheath: round, fine densely pubescent, split, glaucous, margins overlapping, bases of dead sheath pale brown.
 Collar: indistinct, narrow, glabrous.
 Ligule: 0.5 mm or obsolete, truncate, ciliate.
 Auricle: none or merely enlarged at margins.
 Blade: 1 mm x 5–15 cm, folded, bristle-like, pale glaucous, deeply ridged above, glabrous or finely pubescent at base, less scabrous, margins smooth.

***Festuca rubra*—Red fescue (17)**

Habit: perennial, tufted, rhizomes short (when present).
 Vernation: folded.
 Sheath: oval to round, finely pubescent, split in part, dead sheaths reddish brown, becoming fibrillose.
 Collar: indistinct, narrow, glabrous.
 Ligule: 0.5 mm, truncate, entire or ciliate.
 Auricle: none or merely enlarged margins.
 Blade: 1.5–3 mm x 5–15 (25) cm, thick, V-shaped, or folded, bristle-like, deeply ridged above, margins smooth.
 (Note: No strain of red fescue is strongly creeping under Wisconsin conditions. Creeping red fescue is slightly more aggressive than Chewings.)

***Lolium multiflorum*—
Italian ryegrass (9)**

Similar to *Lolium perenne* but veneration is rolled, the ligule entire, and the blade is 4–7 mm x 10–40 cm.

(Note: Annual ryegrass does not live over winter in Wisconsin. Improved turf-type perennial ryegrasses are smaller in size than common perennial ryegrass, more cold tolerant but otherwise similar.)

***Lolium perenne*—
Perennial ryegrass (8)**

Habit: perennial, tufted.

Vernation: folded.

Sheath: round and somewhat compressed; split but lowermost somewhat closed, glabrous, pale green, reddish at base.

Collar: narrow, conspicuous, glabrous, whitish yellow-green.

Ligule: 0–2 mm, rounded to obtuse, margin finely toothed near apex.

Auricle: moderate size, soft and clawlike.

Blade: 2–6 mm x 5–20 cm, sharp and long pointed, keeled, prominently ridged above, margins somewhat scabrous.

***Muhlenbergia schreberi*—
Nimblewill (27)**

Habit: perennial, decumbent at base and rooting at nodes.

Vernation: rolled.

Sheath: oval, split glabrous.

Collar: conspicuous, whitish, pilose at margins.

Ligule: somewhat rounded and undulate.

Auricle: none.

Blade: 2–4 mm x 5 cm, flat, sheaths and blades very wavy.

(Note: Occasionally other *Muhlenbergia* (Muhly-grass) species, such as *M. racemosa* and *M. mexicana* have been reported to invade lawns. These are much larger and more vigorous than nimblewill, have stout and scaly rhizomes, and wider and longer leaves. Usually they occur near margins of naturally forested areas, especially on low-lying ground.)

***Panicum capillare*—
Tickle grass (1)**

Habit: annual, tufted.

Vernation: somewhat rolled.

Sheath: less rolled, split papillose-hispid, dull green, margins hyaline and overlapping.

Collar: conspicuous, broad, pubescent, yellowish-green.

Ligule: 1–1.3 mm long, variable length, ciliate hairs.

Blade: 8–20 mm x 8–25 cm, cordate, margins papillose-pilose, broad white midribs, sharp-tipped, densely short pubescent above and below, margins scabrous.

***Poa annua*—
Annual bluegrass (24)**

Habit: annual, tufted, rooting at nodes.

Vernation: folded.

Sheath: folded, somewhat keeled, split to near base, glabrous, margins overlapping and scarious.

Collar: conspicuous, glabrous, pale green, V-shaped.

Ligule: 1–3.5 mm, white, obtuse, margin entire, somewhat pubescent on outside.

Auricle: none.

Blade: 1.5–4 mm x 2–8 cm, flat or somewhat V-shaped, broader at base, tapering tip, slightly scabrous, pale green, margins minutely hairy and retrorsely so at base.

***Poa compressa*—
Canada bluegrass (16)**

Habit: perennial, rhizomatic.

Vernation: folded.

Sheath: elliptical and strongly compressed, sharply keeled, split to base, glabrous.

Collar: narrow, glabrous, light green, divided by midrib.

Ligule: 0.2–1.2 mm, truncate, entire.

Auricle: none.

Blade: 1–4 mm x 2–10 cm, somewhat keeled, margins somewhat scabrous, blue-green, keeled below and boat-shaped at tip.

***Poa pratensis*—
Kentucky bluegrass (18)**

Habit: perennial, rhizomatic.

Vernation: folded.

Sheath: somewhat compressed but not keeled, glabrous, closed when young but split with age.

Collar: medium broad, somewhat ciliate, yellow-green, somewhat divided by midrib.

Ligule: 0.2–1 mm, collar-shaped margin very short, ciliate, very finely pubescent on back.

Auricle: none.

Blade: 2–5 mm x 5–40 cm, somewhat V-shaped, folded in dry weather, keeled below, abruptly boat-shaped at tip, margins somewhat scabrous.

***Poa trivialis*—Rough stalk meadow grass (25)**

Habit: perennial, stolons, rooting at nodes.
 Vernation: folded.
 Sheath: compressed, keeled, somewhat scabrous, green or purplish, split in part only, retrorsely scabrous.
 Collar: broad, conspicuous, glabrous, divided by midrib.
 Ligule: 2–3 mm, acute, entire of ciliate.
 Auricle: none.
 Blade: 2–4.5 mm x 7–15 cm, flat, tapering from base to tip, narrowly boat-shaped at tip, margins scabrous.

***Phleum pratense*—Timothy (15)**

Habit: perennial, tufted, bulbous base.
 Vernation: rolled.
 Sheath: round, split, hyaline margins, glabrous.
 Collar: broad, conspicuous, glabrous, light green.
 Ligule: 1–2.5 mm, somewhat rounded or obtuse, distinctly notched on either side.
 Auricle: none.
 Blade: 4–12 mm x 7–25 cm, somewhat barbed on margins, light green, slightly keeled at base, margins scabrous, retrorsely so at base.

***Setaria lutescens*—Yellow foxtail, yellow pigeongrass (6)**

Habit: annual, semi-erect.
 Vernation: rolled.
 Sheath: very compressed, sharply keeled, glabrous, often purplish-red at base, split, hyaline margins.
 Collar: narrow, conspicuous, glabrous, pale green, purplish or reddish.

Ligule: 1 mm, short hairs fused at base.

Auricle: none.
 Blade: 4–10 mm x 5–30 cm, flat, V-shaped at base, keeled, twisted hairs at base, tapers to a point, margins somewhat scabrous.

***Setaria verticillata*—Bristly foxtail, bur pigeongrass (5)**

Habit: annual, tufted.
 Vernation: rolled.
 Sheath: flattened or keeled, split, margins ciliate, mostly glabrous but sometimes hairy below.
 Collar: inconspicuous, yellow-green, appressed, pubescent.
 Ligule: 1–1.5 mm, truncate, somewhat ciliate.

Auricle: none.
 Blade: 5–10 mm x 8–15 cm, margins somewhat barbed, glabrous to somewhat hairy.

***Setaria viridis*—Green foxtail, green pigeongrass (4)**

Habit: annual, tufted, somewhat erect, branching from base.
 Vernation: rolled.
 Sheath: mostly round, not keeled, somewhat glabrous or sparsely pubescent, light green or purplish at base, split, margins with hairs approximately 1 mm.
 Collar: broad, conspicuous, yellow-green or reddish, pubescent at base.

Ligule: 1–2 mm, longer at edges, hairs fused at base.

Auricle: none.
 Blade: 4–10 mm x 5–20 cm, flat, not keeled, tapering to sharp tip, margins scabrous.

***Sporobolus cryptandrus*—Sand dropseed (3)**

Habit: perennial, tufted, sometimes somewhat rhizomatic.
 Vernation: rolled.
 Sheath: round to oval, split, margins mostly ciliate or pilose lanate below collar.
 Collar: long pilose on outside, mostly less than 4 mm long.
 Ligule: 0.5 mm, collar-shaped ring of hairs.
 Auricle: none.
 Blade: 2–5 mm x 5–15 cm, margins somewhat scabrous, glabrous or somewhat scabrous above, flat toward base but tip rounded and long.

***Sporobolus vaginiflorus*—Dropseed**

Habit: annual, tufted, branching from base.
 Vernation: rolled.
 Sheath: rounded, often swollen, glabrous but ciliate at throat, split, margins hyaline 1.5–5 mm long.
 Collar: inconspicuous, whitish green, long pilose hairs at margins.
 Ligule: 0.2 mm, collar-shaped ring of hairs, few long hairs at margin at confluence with collar.
 Auricle: none.
 Blade: 2 mm x 3–7.5 cm, involute at tips, glabrous or nearly so.

Glossary

Acute—tapering to a sharp point or well-defined angle.

Apex—the pointed end of a blade.

Appressed—lying close and flat against.

Ascending—curving upward.

Auricle—an ear-shaped appendage.

Blade—the part of a grass leaf above the sheath.

Barbed—rigid points or short bristles, usually like the barb of a fish-hook.

Bulbous—swollen; bulb-like.

Ciliate—fringed with hairs along the margin; somewhat like an eyelash.

Collar—the area on the outside (underside) of a grass at the junction of the blade and the sheath.

Compressed—flattened from the sides, the fold forming a ridge or a keel like the bottom of a boat.

Constricted—pinched or narrowed.

Cordate—heartshaped.

Culm—the stem of a grass, a rush, or a sedge.

Decumbent—reclining on the ground with the tip ascending.

Divided—broken into two or more parts, such as the ligule is divided by the mid-nerve.

Entire—without divisions, lobes, teeth, or hairs.

Fibrillose—many fine fibers.

Folded (in bud)—leaves folded together lengthwise without edges overlapping, as seen in the cross-section of a young shoot.

Glabrous—hairs absent.

Gland—a secreting surface or structure; any small protuberance or depression that gives off a fluid.

Habit—general appearance of the plant.

Hispid—with stiff or rigid hairs or small bristles.

Hyaline—transparent or translucent.

Inrolled—rolled inward from the edges with the upper surface within.

Internode—portion of a grass stem between two nodes.

Involute—rolled inward.

Keel—the sharp fold at the back of a flattened sheath or blade.

Lacerate—irregularly divided as if torn.

Lanate—woolly; in reference to hairs.

Ligule—a thin projection (usually transparent or translucent) or ring of hairs on the inside surface of a grass leaf at the junction of the blade and sheath.

Margin—edge of the sheath or leaf blade.

Midnerve—the middle vein of a blade.

Nerve—a vein of a blade.

Node—joint of a grass stem or culm.

Oblique—unequal sided or slanted.

Obsolete—not evident; rudimentary.

Obtuse—blunt or somewhat rounded at the end.

Papillose—having small nipple-shaped projections.

Perennial—living for several years.

Pilose—hairy, usually soft.

Prostrate—lying flat on the ground.

Retorse—directed backwards or downward.

Rhizome—an underground stem that often roots at the nodes (also referred to as rootstock or underground stem).

Rolled (in bud)—rolled together lengthwise with a definite overlapping of the edges, as seen in the cross-section of a young shoot or bud.

Scabrous—rough to the touch.

Scarious—thin, dry, membranaceous, not green.

Sheath—the lower part of a grass leaf; the portion of a grass leaf that encloses the culm or stem.

Split—divided or open as often seen in the upper part of the sheath.

Stolon—a horizontal above-ground stem that roots at nodes; frequently green.

Throat—the upper part of a grass leaf between the sheath and the blade.

Truncate—ending abruptly as if cut off horizontally.

Undulate—wavy surface or edge.

Vernation—arrangement of leaves inside the bud or shoot.



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