



Sask  
Forage  
Council

# FIELD GUIDE

## Identification of Common Seeded Plants for Forage and Reclamation in Saskatchewan

Canada



Government of  
Saskatchewan

**Cover photo:** Crested Wheatgrass, Meadow Brome,  
Alfalfa community northeast of Eastend on the  
H Double Bar Ranch of Howard and Gail Bock.  
**Photo credit:** Alicia N. Hargrave



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## Introduction

This field guide is intended for basic plant identification and reviews common seeded plants for forage and reclamation found in pastures, hayland, and reclaimed sites throughout Saskatchewan. It is primarily designed for producers, land managers, and extension personnel. For a more complete listing of plants or more detailed identification, please refer to the resources in the References section on page 75.

There are four sections in this guide:

- **Grasses**
- **Grassy Weeds**
- **Legumes**
- **Shrubs**

The first two sections correspond to **Grasses**, plants with parallel-veined, linear leaves. The main grasses used in the forage and reclamation industries are included in this guide. The next section is **Grassy Weeds** that commonly grow among seeded plants. The third section corresponds with forbs, plants with net-veined, broad leaves. The forbs in this guide are **Legumes**, a plant family that has the ability to fix nitrogen from the air, therefore increasing soil nitrogen and hence yield of the crop or reclaimed site. There is also one **Shrub** in this guide.

Vegetative and flower characteristics are used to describe plants in this guide, in conjunction with illustrations of mature plants, seeds, and seedling photos. The species habitat, growth requirements, primary use(s), and height are included. Growth form is listed if not erect (ie. spreading). The perennial growth habit applies to all species unless otherwise noted (ie. annual, biennial). Grasses can have one of two designations: cool season or warm season. These designations refer to differences in how plants perform photosynthesis. Warm season species have photosynthetic processes that are more efficient in warmer, drier environments. Therefore, growth of warm season species is later in the growing season while cool season species grow in the spring and early summer. The cool season designation applies to all grass species in Saskatchewan unless otherwise noted.

Some of the plant species in this field guide have a “Similar Species” box below the illustration. These plants are closely related to the illustrated plant, but have distinguishing features. To differentiate between species, only these distinguishing features are listed.

With ongoing research in taxonomy, the grouping of plants is continually changing where individual species are placed in relation to others. With this reorganization, comes a change in the scientific name. New Latin names are listed in the index in brackets behind the commonly used Latin names.

To help in identifying common seeded plants in your area, first start in a location which has had little to no grazing or which has not been cut. Flowering heads and seeds will assist in the identification process. Then use the following steps to identify the species:

1. Determine the plant group for the specimen using the description in the third paragraph on the previous page (ie. Grasses, Grassy Weeds, Legumes, and Shrubs).
2. Review the basic plant characteristics for each plant group on the introductory page of each section (ie. Grass Plant Parts, Leaf Morphology for Forbs and Shrubs).
3. Identify the species by using the identifying characteristics, illustrations, and photographs.

Three other guides exist in this series to identify plants in other areas or habitats of Saskatchewan. Please contact the Saskatchewan Forage Council (SFC), as well as local Saskatchewan Agriculture and Food (SAF) or Agriculture and Agri-Food Canada-Prairie Farm Rehabilitation Administration (AAFC-PFRA) district offices, for copies of this publication and the field guides listed below.

- *Field Guide: Identification of Common Range Plants of Southern Saskatchewan*
- *Field Guide: Identification of Common Range Plants of Northern Saskatchewan*
- *Field Guide: Identification of Common Riparian Plants of Saskatchewan*

For further information on forage and reclamation species, please refer to the Saskatchewan Forage Council’s *Dryland Forage Species Adaptation CD*, and the *Successful Forage Crop Establishment Bulletin*.

## Acknowledgements

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Illustrations in this field guide were copied and used with permission from a number of sources. Elaine L. Muth of Saskatoon, Saskatchewan produced one of the illustrations, as noted on page 79.

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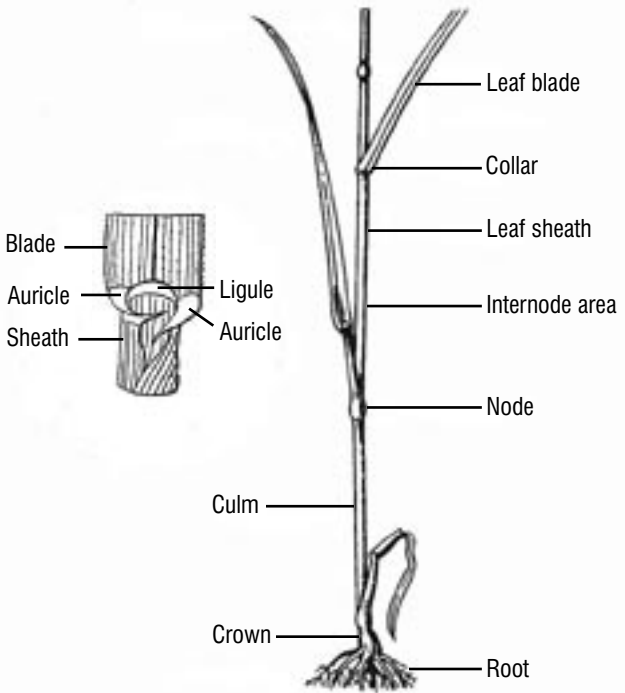
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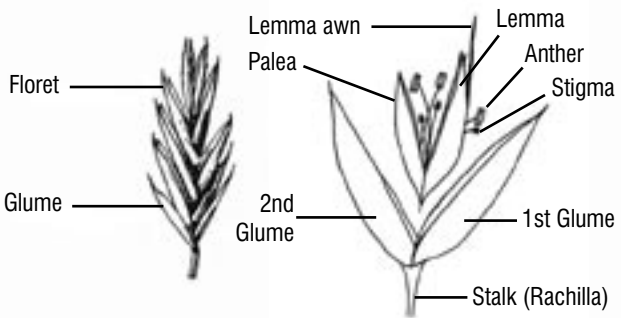


# The Grass Plant Parts



## Spikelet

## Floret



## Fibrous Roots

## Rhizomatous Roots



# Grass Flowering Heads

## A. Spike

Unbranched, terminal flowering head with spikelets attached directly to the central axis (Example: wheatgrass).



## B. Comb-like Spike

Unbranched flowering head with spikelets attached directly to the central axis and arranged on one side like a comb; spikes may not be terminal (Example: blue grama).



## C. Raceme

Unbranched flowering head with spikelets borne on stalks attached to the central axis (Example: little bluestem).



## D. Panicle

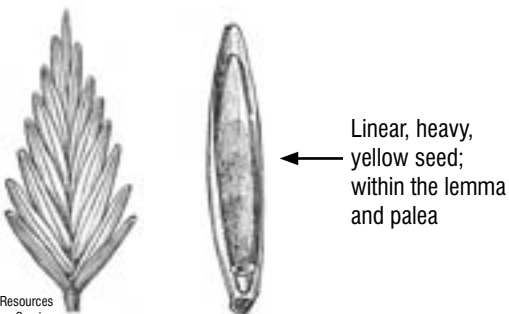
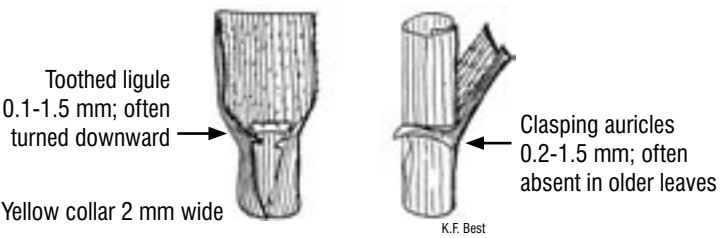
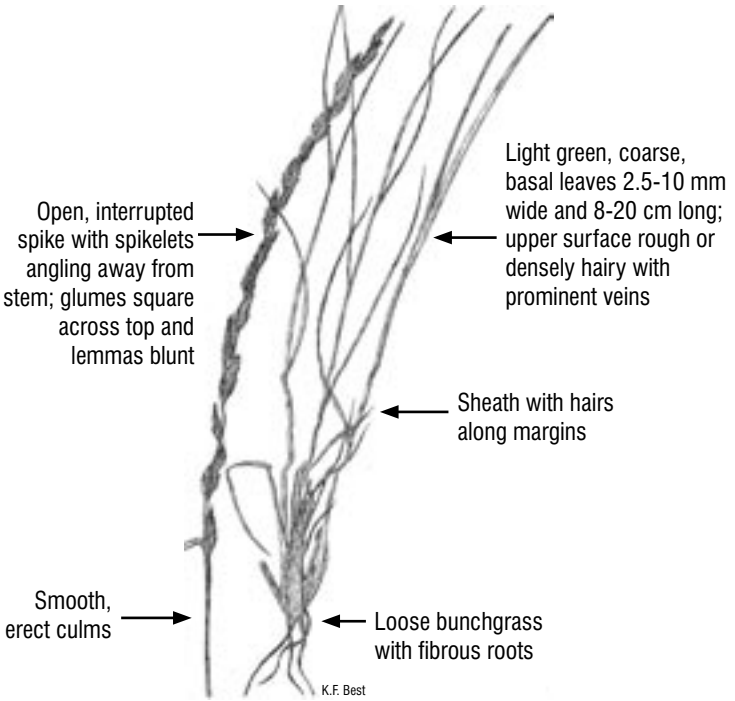
Branched flowering head with spikelets borne on stalks and lower branches longest and flowering first (Examples: bromes, bluegrasses).



# Tall Wheatgrass

## *Agropyron elongatum*

- Culm 50-200 cm, spike 10-30 cm
- Moist, moderately saline soils
- Most salt-tolerant introduced grass
- Hay, pasture, soil stabilization, and saline-site reclamation

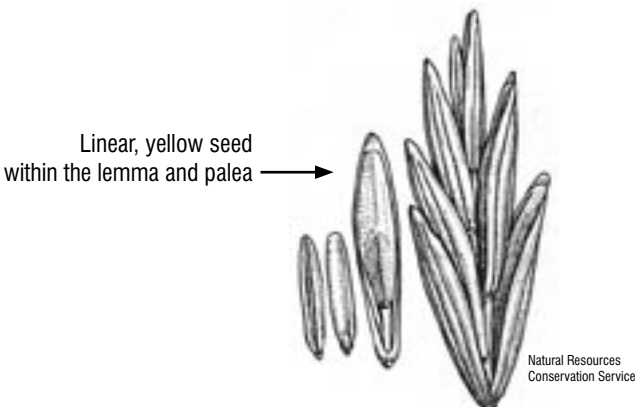
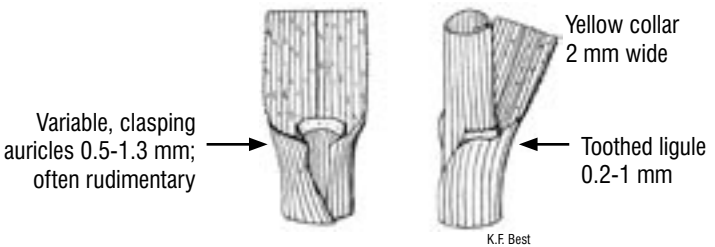
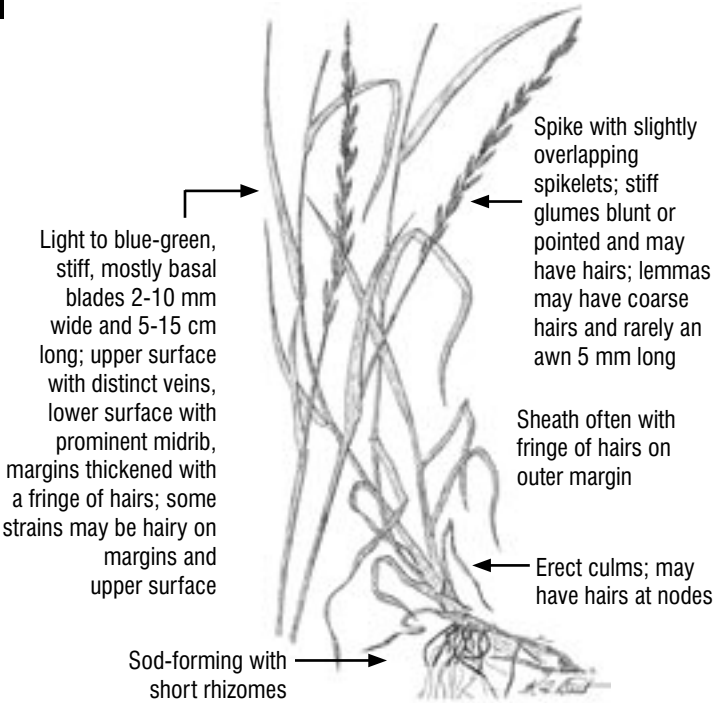


Natural Resources  
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# Intermediate Wheatgrass

## *Agropyron intermedium*

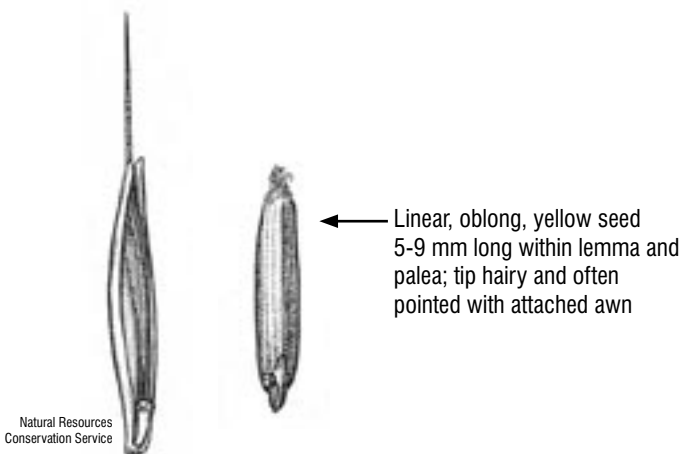
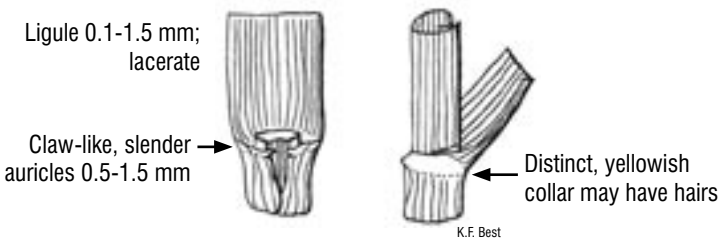
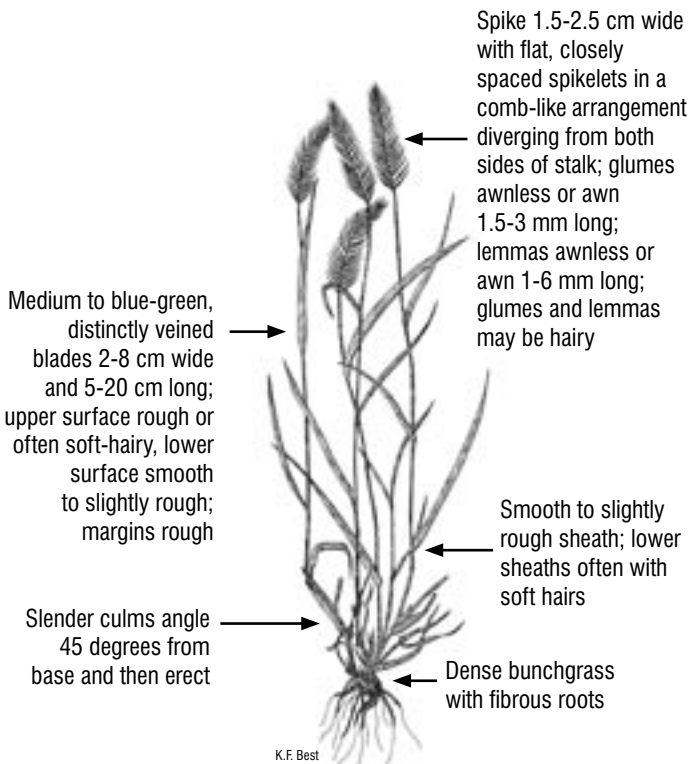
- Culm 60-150 cm, spike 10-25 cm
- Well-drained, fertile soils; grows best with > 350 mm/year precipitation
- Introduced
- Pasture, hay, and soil stabilization



# Crested Wheatgrass

## *Agropyron cristatum*

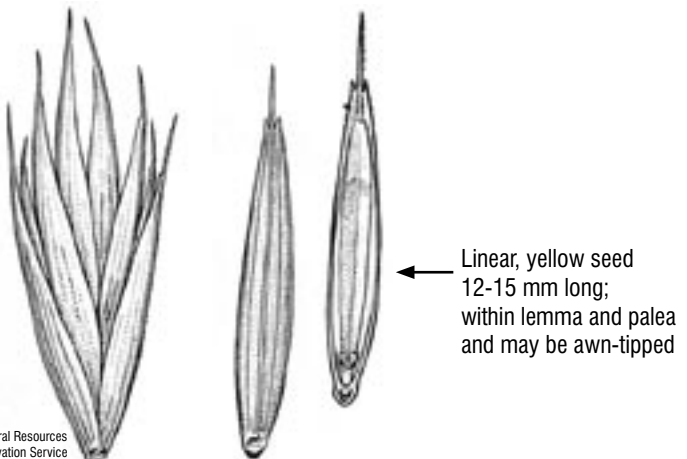
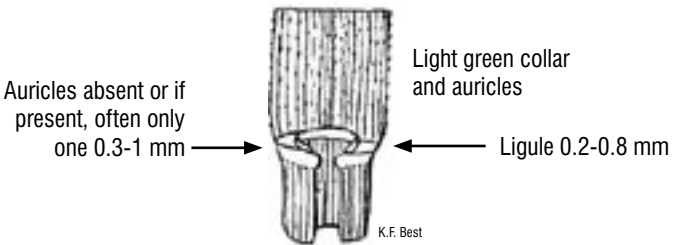
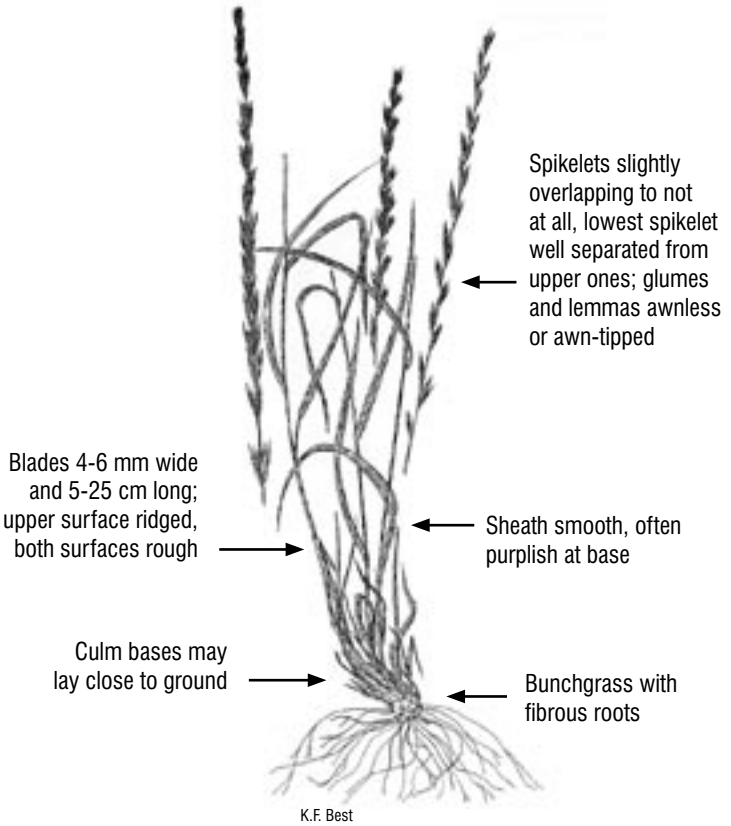
- Culm 30-100 cm, spike 2-7 cm
- Drought tolerant, widely adapted grass prefers well-drained soils
- Introduced, invasive in natural areas
- Pasture, hay, and soil stabilization



# Slender Wheatgrass

## *Agropyron trachycaulum*

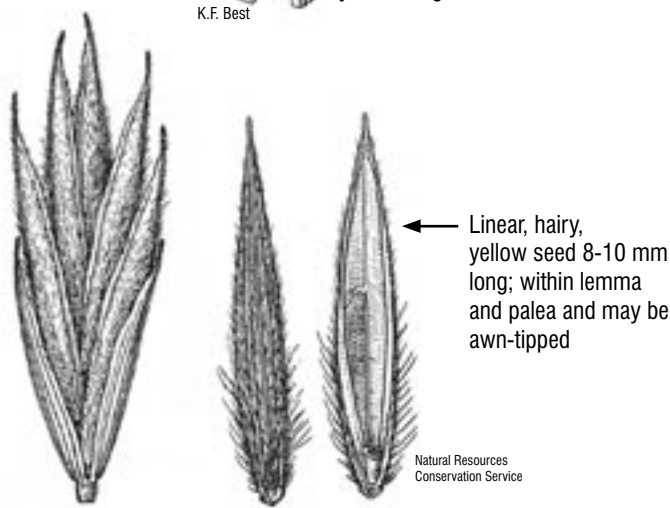
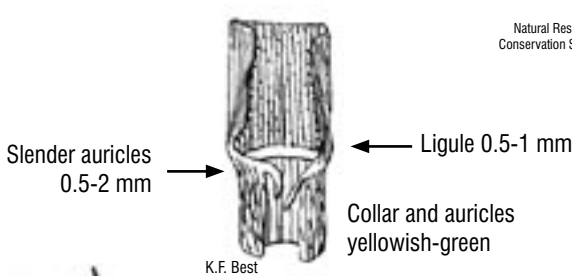
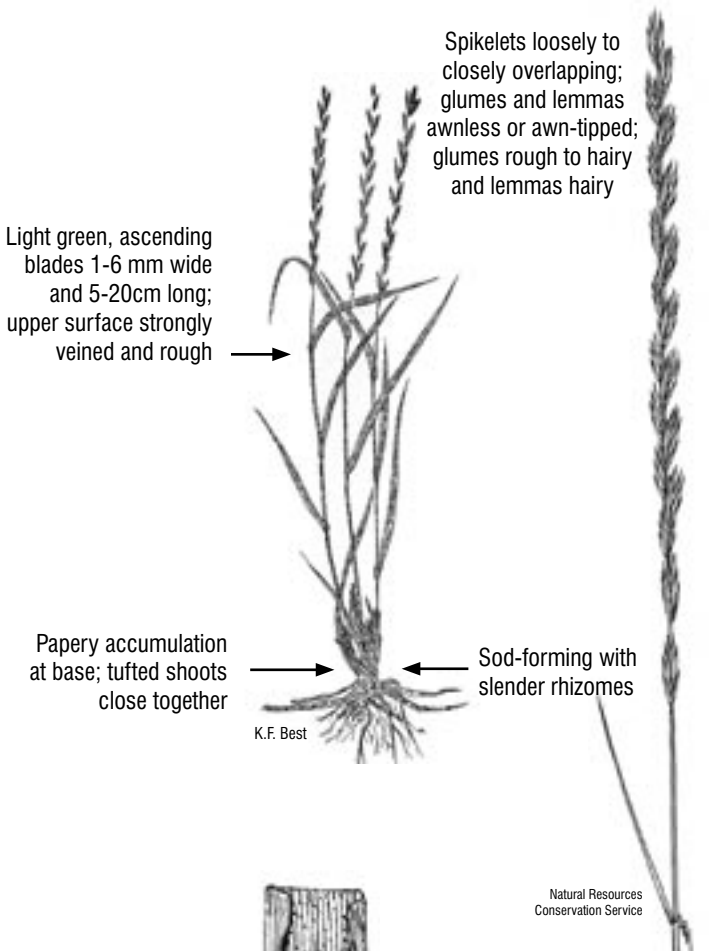
- Culm 50-100 cm, spike 10-25 cm, erect or slightly nodding
- Moist soils, tolerates salinity
- Native
- Reclamation, hay, and pasture



# Northern Wheatgrass

## *Agropyron dasystachyum*

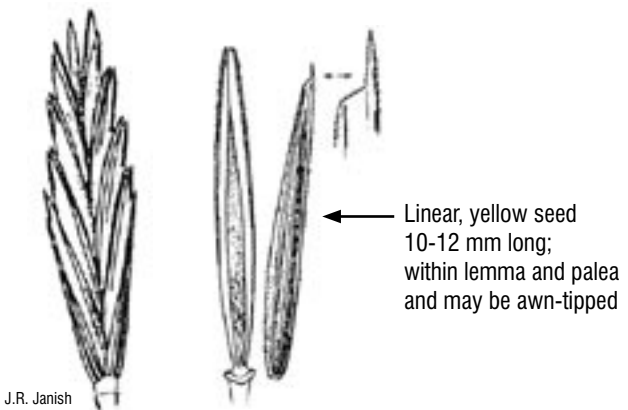
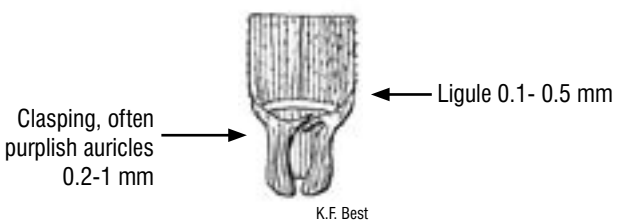
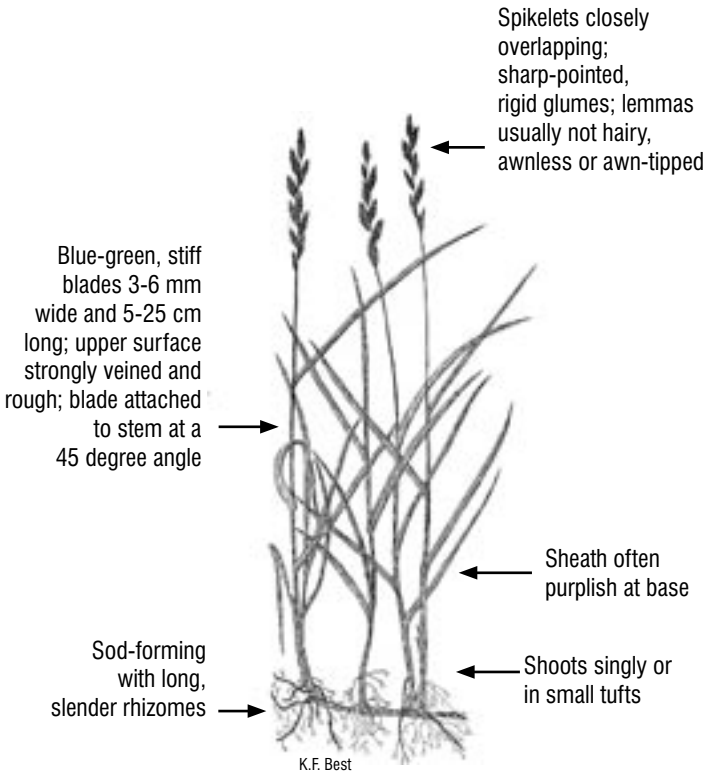
- Culm 40-70 cm, spike 6-15 cm
- Most common wheatgrass on the native prairies; drought tolerant
- Reclamation, pasture, and hay



# Western Wheatgrass / Bluejoint

## *Agropyron smithii*

- Culm 30-60 cm, spike 7-15 cm
- Wide variety of sites but grows best on moist, saline, and heavy soils
- Native
- Reclamation, pasture, and hay

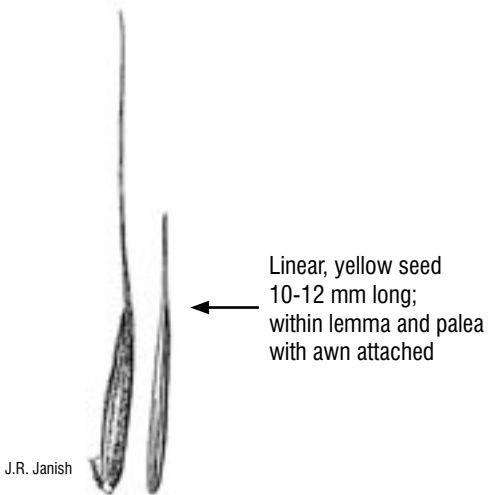
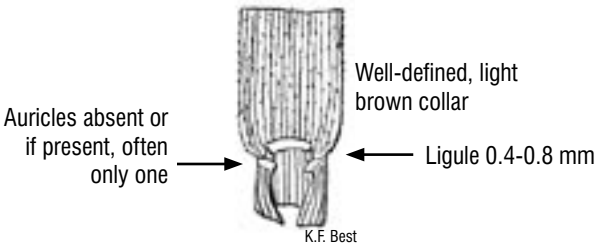
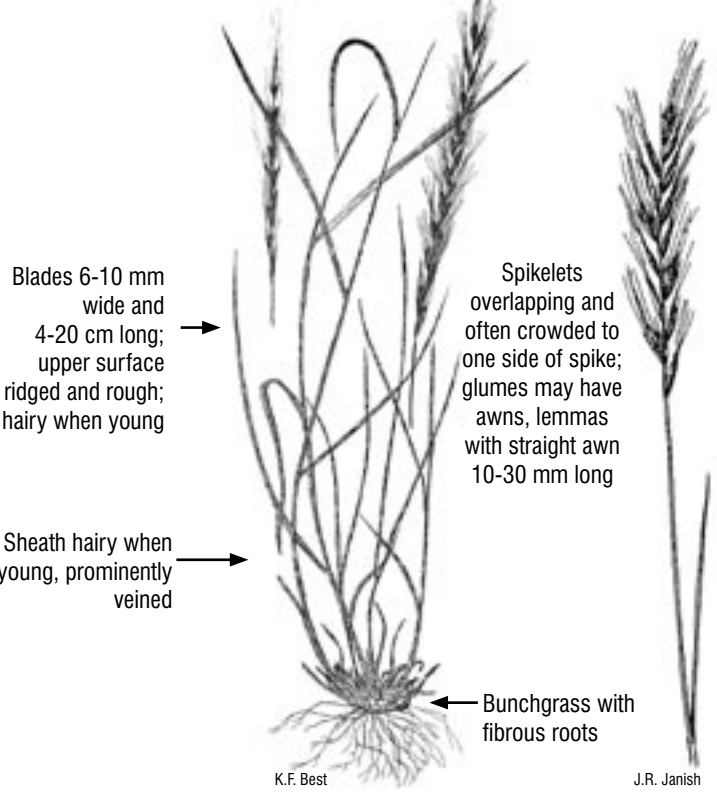




# Awned / Bearded Wheatgrass

## *Agropyron subsecundum*

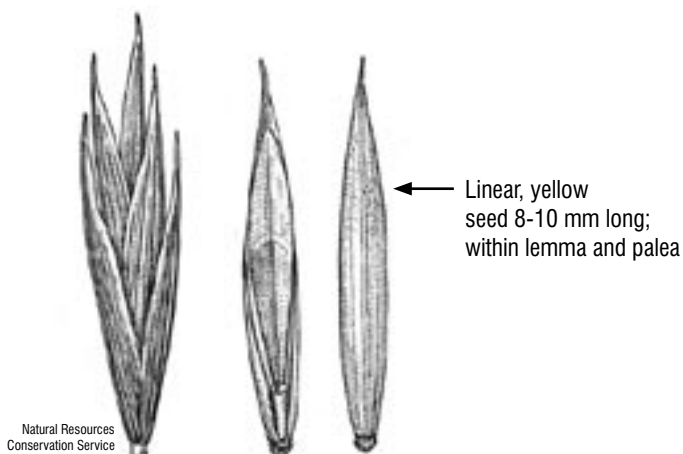
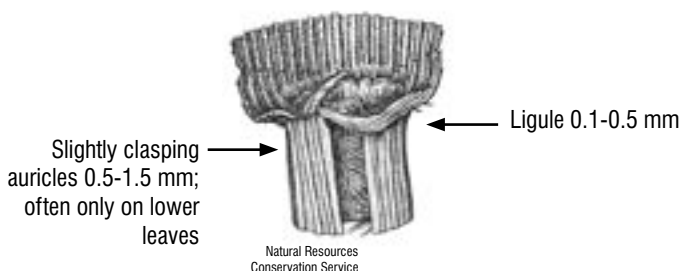
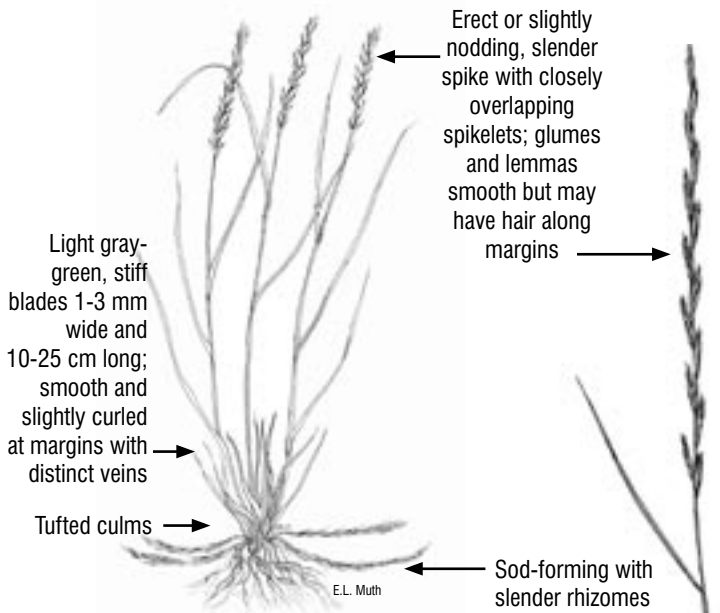
- Culm 50-100 cm, spike 5-20 cm, erect or slightly nodding
- Moist, well-drained, fertile soils
- Native
- Reclamation



# Streambank Wheatgrass

## *Agropyron riparium*

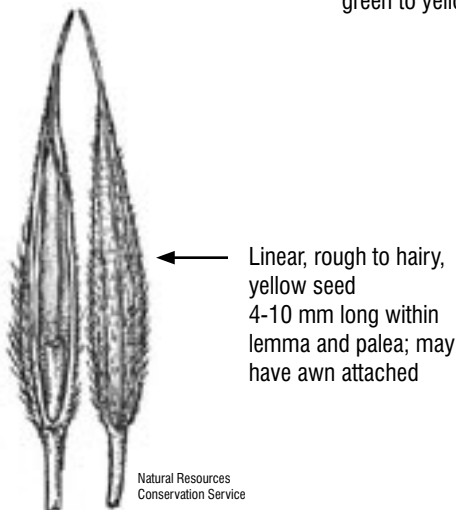
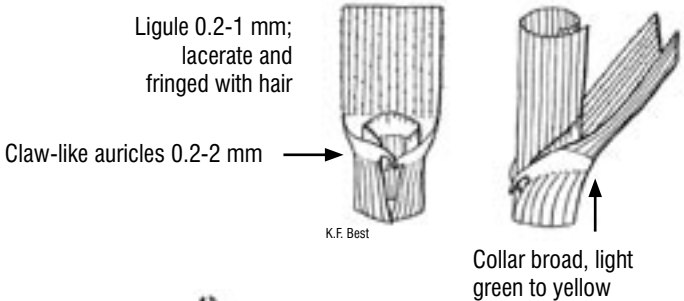
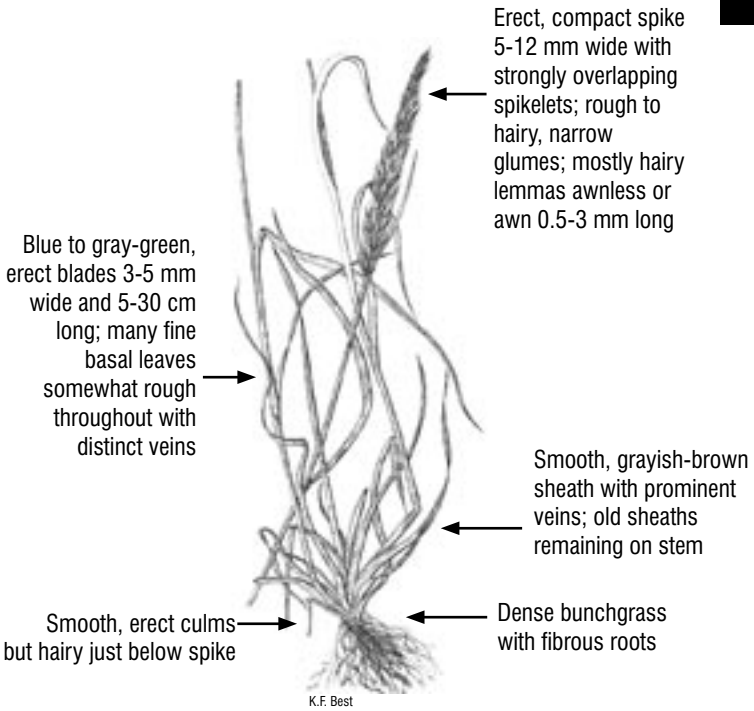
- Culm 30-80 cm, spike 5-10 cm
- Well-drained soils, tolerates moderate salinity and drought
- Native; less productivity than other wheatgrass species
- Reclamation and soil stabilization



# Russian Wildrye

## *Elymus juncea*

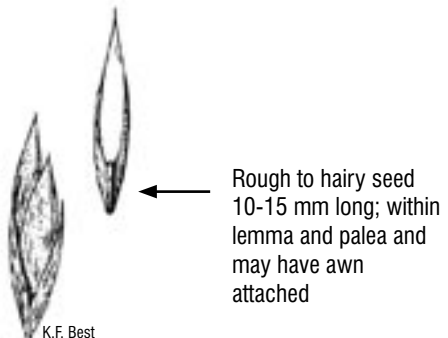
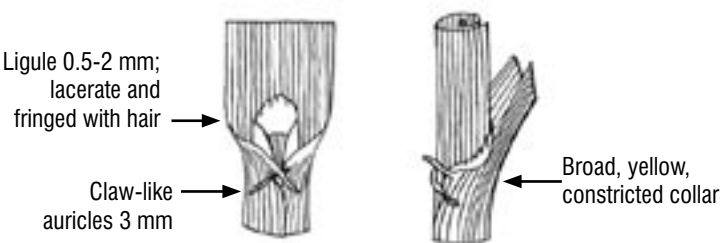
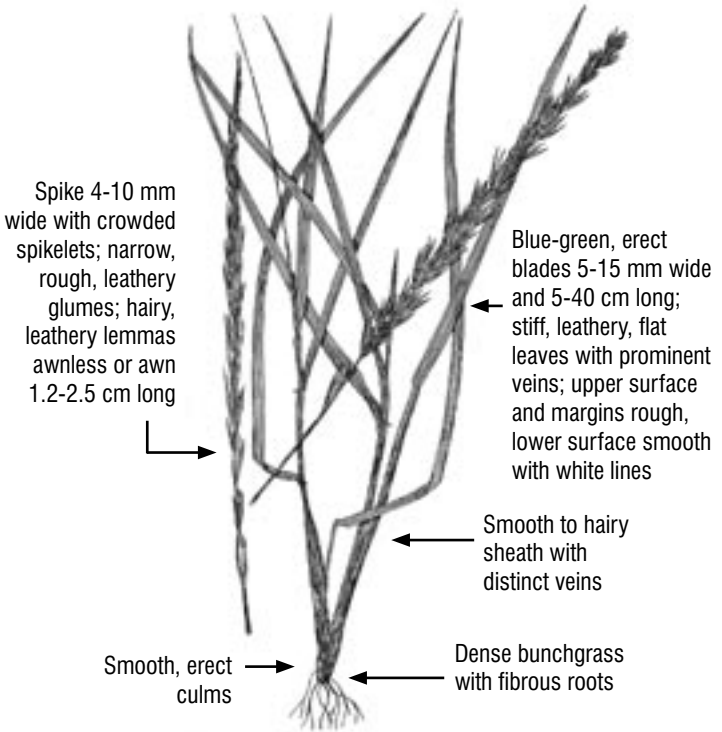
- Culm 30-100 cm, spike 5-12 cm
- Fertile, preferably loam and clay soils; tolerates salinity and drought
- Introduced
- Pasture



# Altai Wildrye

## *Elymus angustus*

- Culm 60-100 cm, spike 10-20 cm
- Prefers loam to clay soils, grows best with > 350 mm/year precipitation; tolerates salinity and drought
- Introduced
- Pasture, saline site reclamation

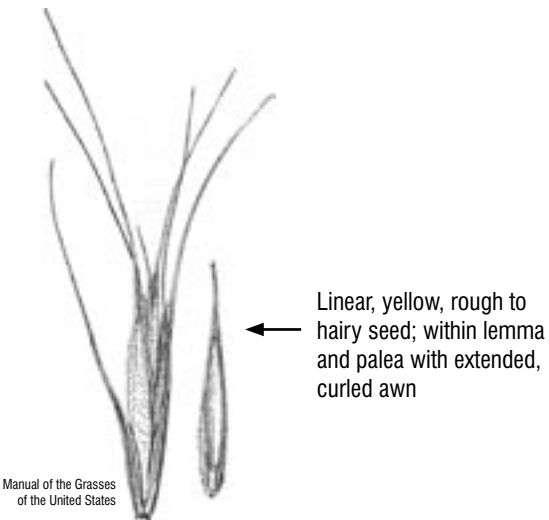
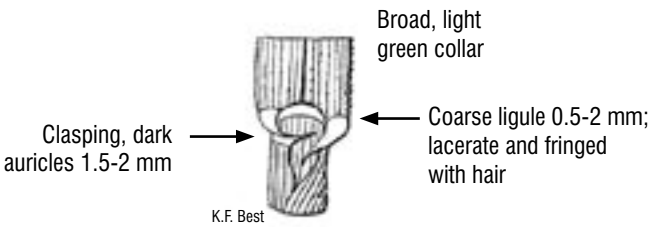
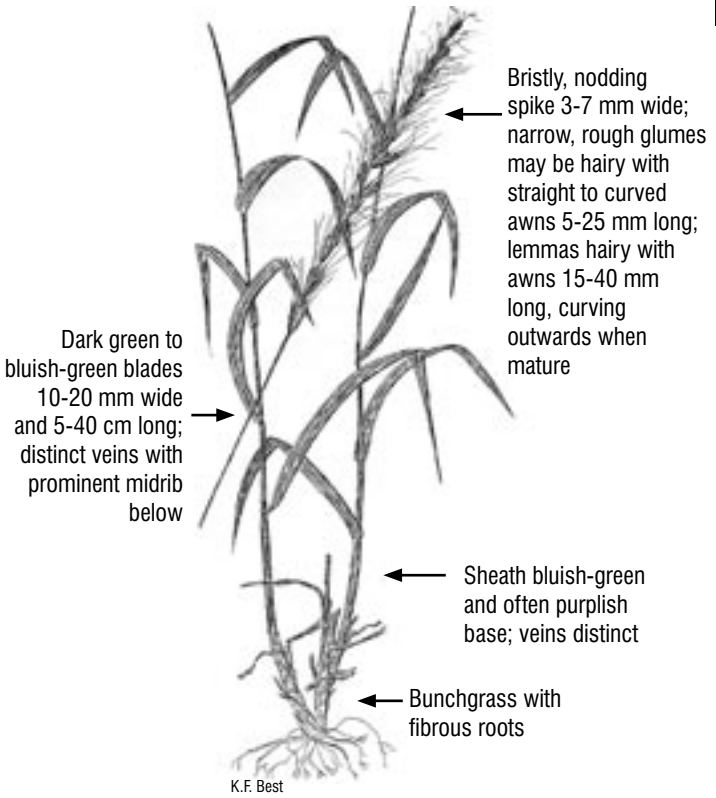


K.F. Best

# Canada Wildrye

## *Elymus canadensis*

- Culm 100-150 cm, spike 10-25 cm
- Often coarse textured soils; tolerates salinity and dry to moist soils
- Native
- Reclamation and soil stabilization

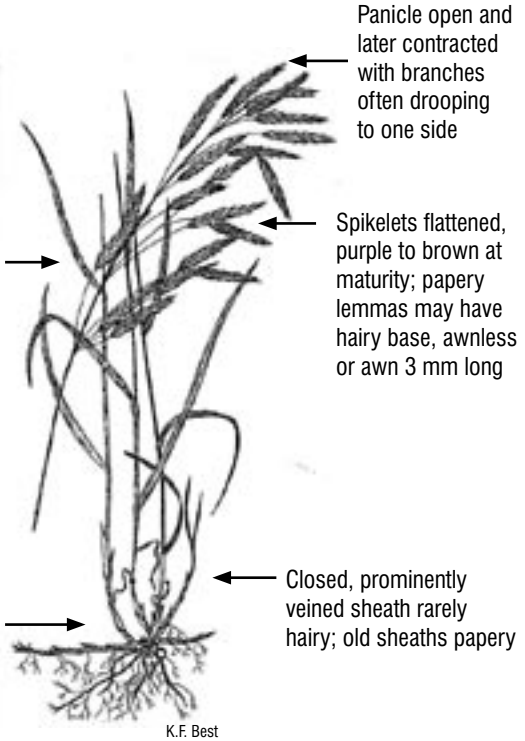


# Smooth Brome

## *Bromus inermis*

- Culm 50-100 cm, panicle 6-20 cm
- Prefers moist, well-drained soils but will grow on most sites
- Introduced, invasive in natural areas
- Hay and pasture

Dark green, flat blades 5-12 mm wide and 15-40 cm long; mostly smooth both sides (rarely hairy or rough) with distinct veins below; 4-7 limp stem leaves often with 'M' constriction near middle



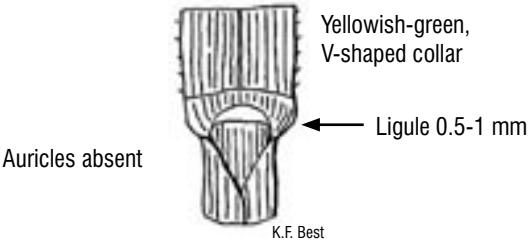
Panicle open and later contracted with branches often drooping to one side

Spikelets flattened, purple to brown at maturity; papery lemmas may have hairy base, awnless or awn 3 mm long

Sod-forming with long rhizomes

Closed, prominently veined sheath rarely hairy; old sheaths papery

K.F. Best



Auricles absent

Yellowish-green, V-shaped collar

Ligule 0.5-1 mm

K.F. Best



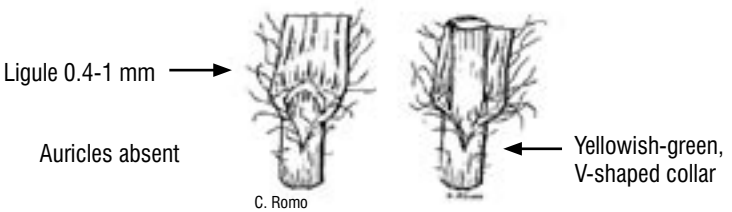
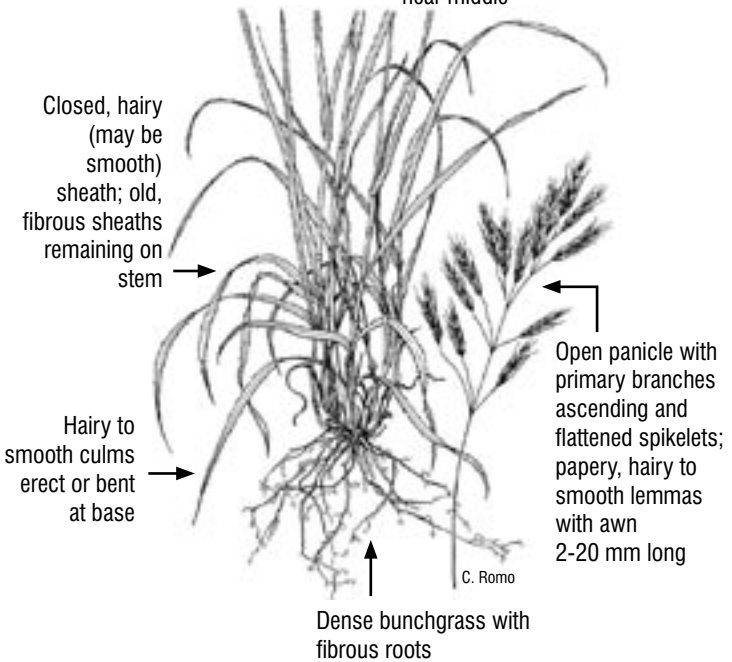
Linear, flat, yellowish to brown seed 4-10 mm long and hairy at base; within lemma and palea and may have awn attached

# Meadow Brome

## *Bromus biebersteinii*

- Culm 30-90 cm, panicle 7-20 cm
- Prefers fertile, well-drained soils, but will grow on most soils; grows best with > 350 mm/year precipitation
- Introduced
- Pasture and hay

Light green, fine blades 2-4 mm wide and 10-20 cm long; many limp basal leaves with extended hairs particularly on margins and often with 'M' constriction near middle

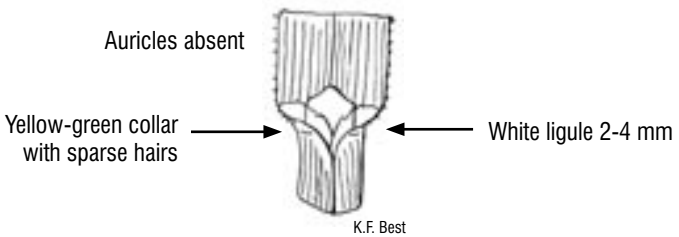
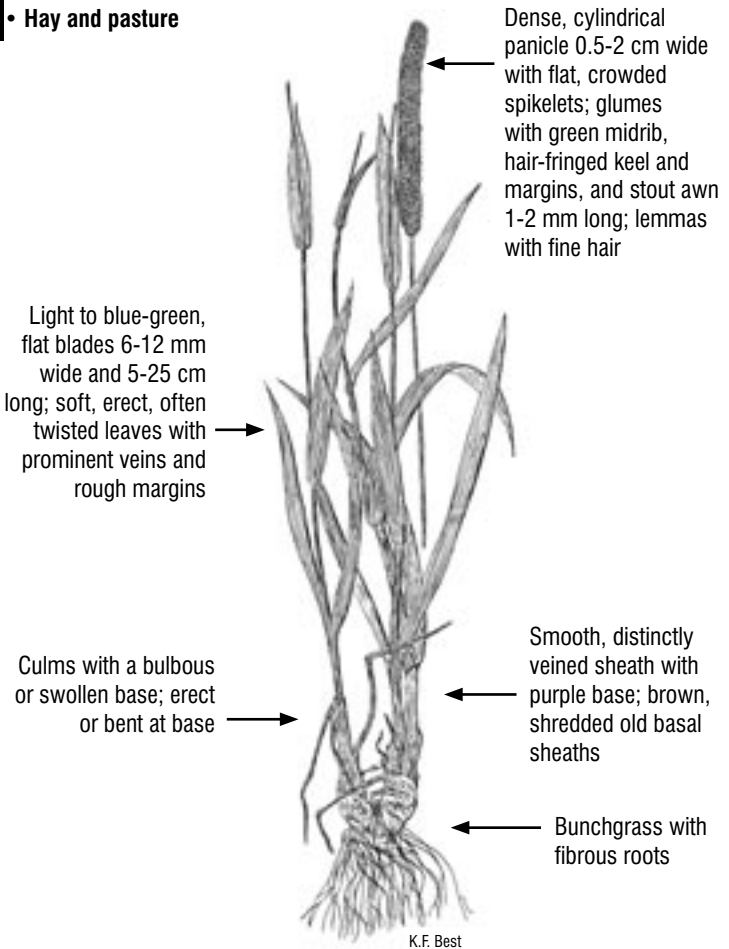


Linear seed 10-12 mm long and hairy at base; within lemma and palea and may have awn attached

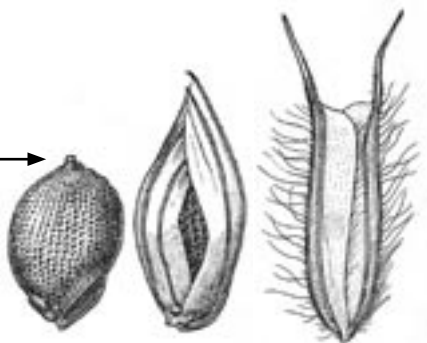
# Timothy

## *Phleum pratense*

- Culm 40-90 cm, panicle 5-20 cm
- Prefers moist, loam to clay soils and tolerates flooding; grows best with > 400 mm/year precipitation
- Introduced
- Hay and pasture



Yellow, shiny seed 1-1.5 mm long; wedge-shaped and rounded with fine ribs and hair; within lemma, palea, and glumes with awn attached

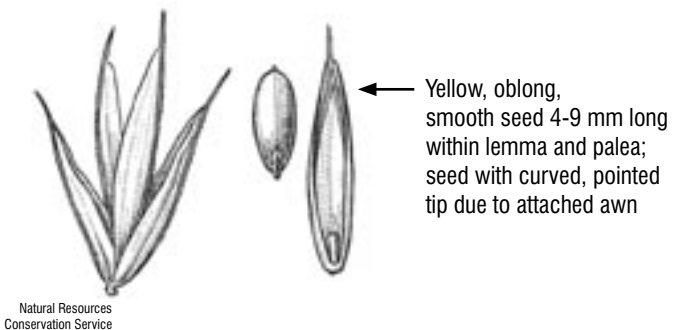
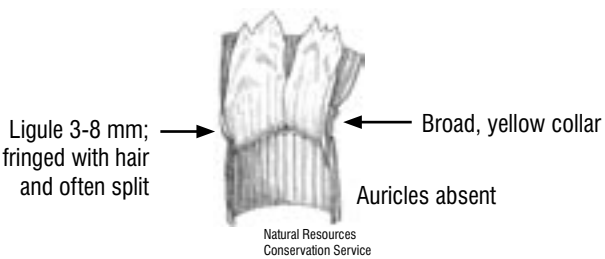
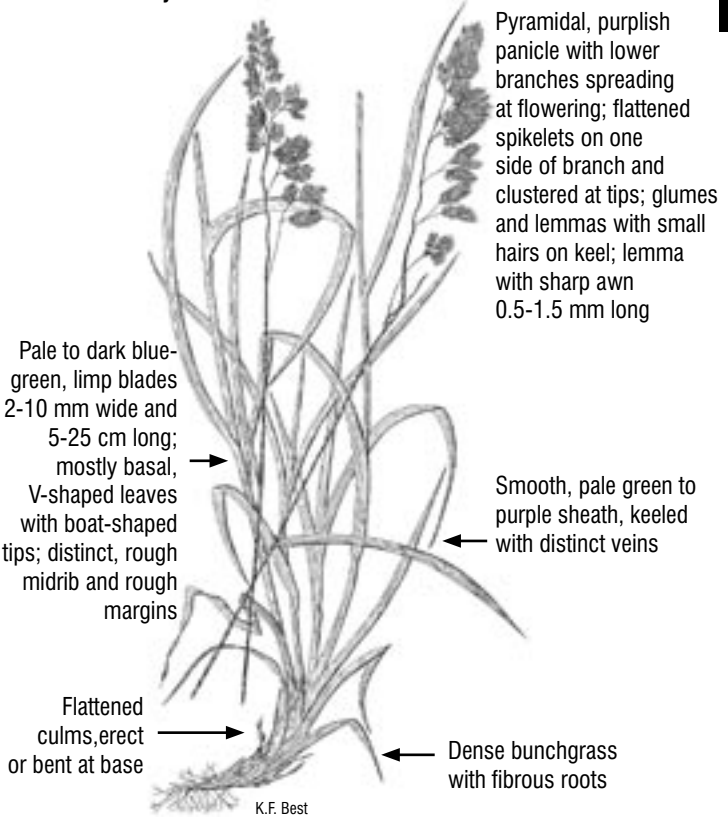




# Orchard Grass

## *Dactylis glomerata*

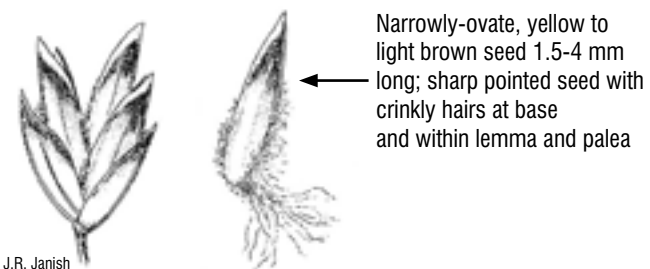
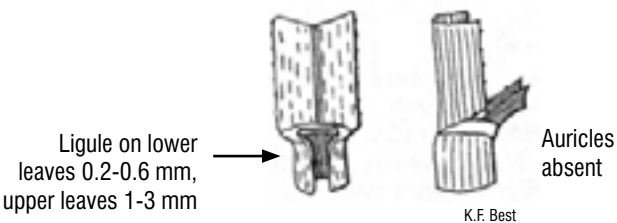
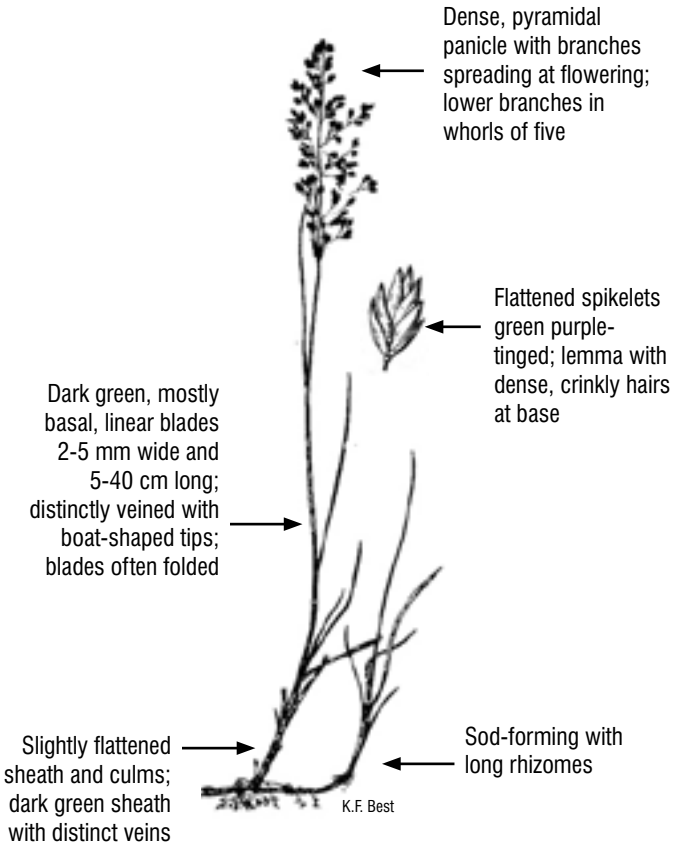
- Culm 60-120 cm, panicle 5-20 cm
- Well-drained, fertile soils; grows best with > 500 mm/year precipitation
- Introduced
- Pasture and hay



# Kentucky Bluegrass

## *Poa pratensis*

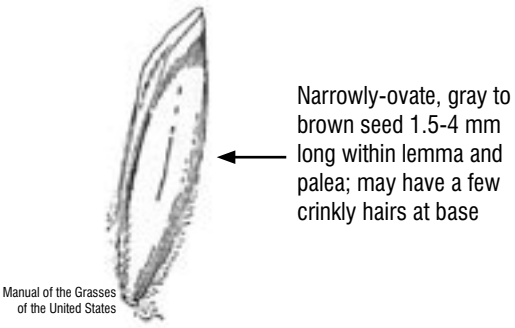
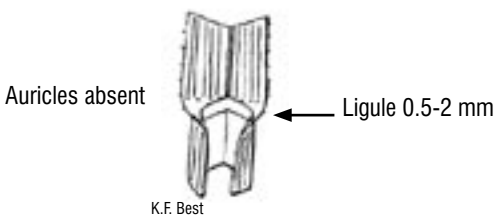
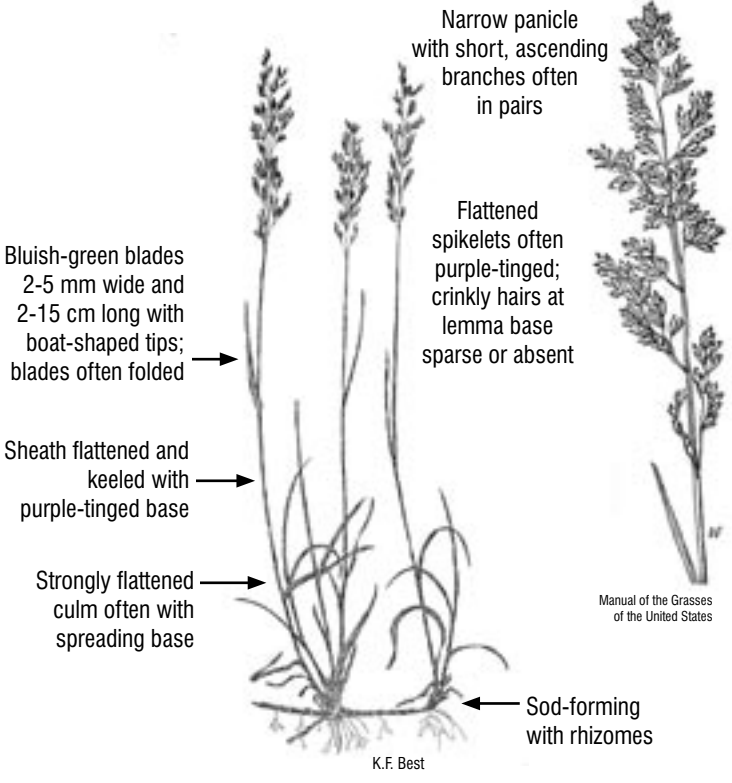
- Culm 30-100 cm, panicle 5-15 cm
- Moist, fertile, well-drained soils
- Possibly introduced, invasive in natural areas
- Pasture and soil stabilization



# Canada Bluegrass

## *Poa compressa*

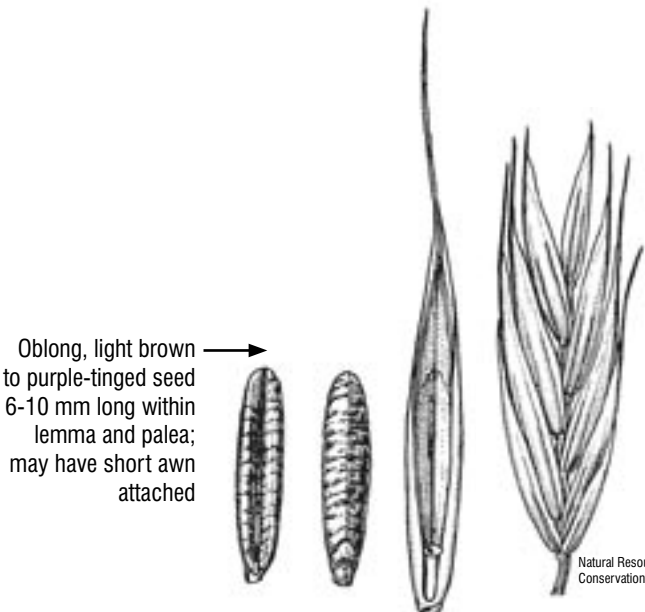
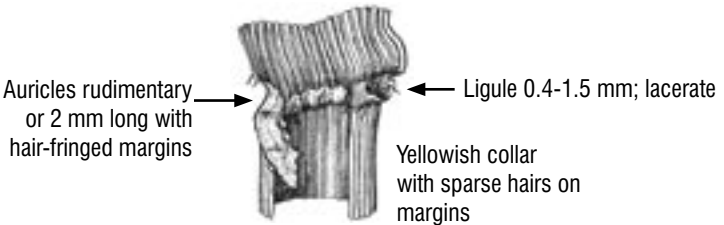
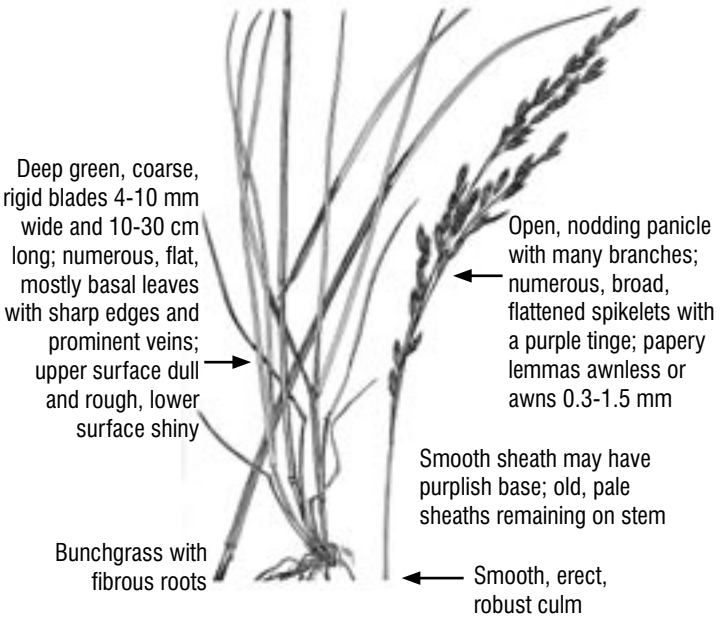
- Culm 15-50 cm, panicle 3-10 cm
- Moist, well-drained, often poor soils
- Introduced, invasive in natural areas
- Pasture and reclamation



# Tall Fescue

## *Festuca arundinacea*

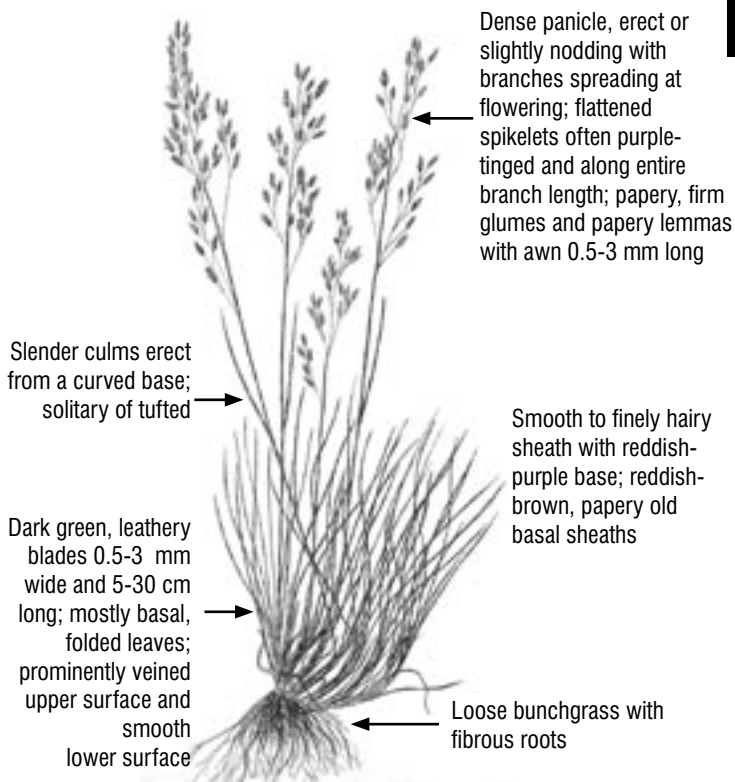
- Culm 60-150 cm, panicle 10-30 cm
- Prefers fertile, loamy soils but grows most places with adequate moisture; tolerates some flooding
- Introduced
- Pasture, hay, and soil stabilization



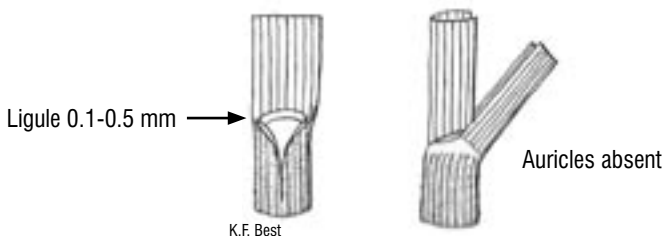
# Creeping Red Fescue

## *Festuca rubra*

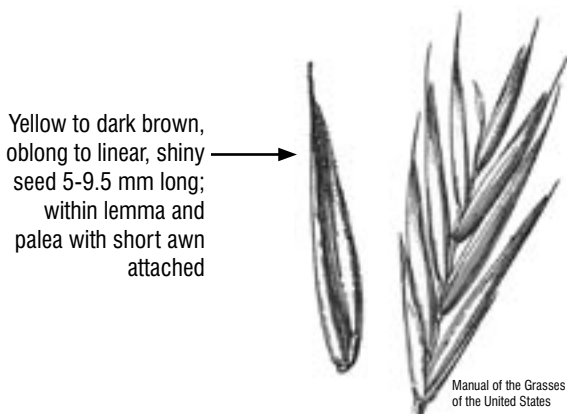
- Culm 15-90 cm, panicle 3-20 cm
- Moist sites on most soil types; tolerates some flooding
- Introduced
- Pasture and soil stabilization



K.F. Best



K.F. Best



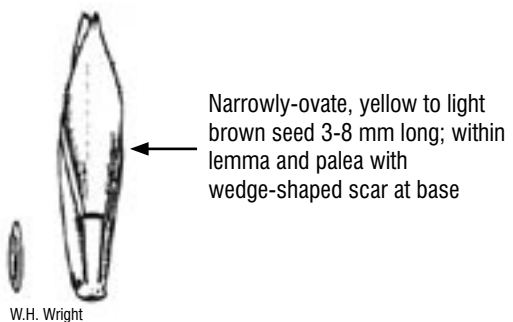
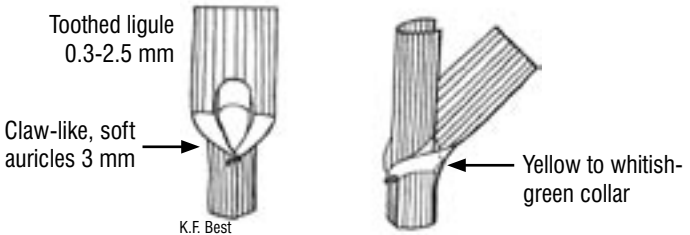
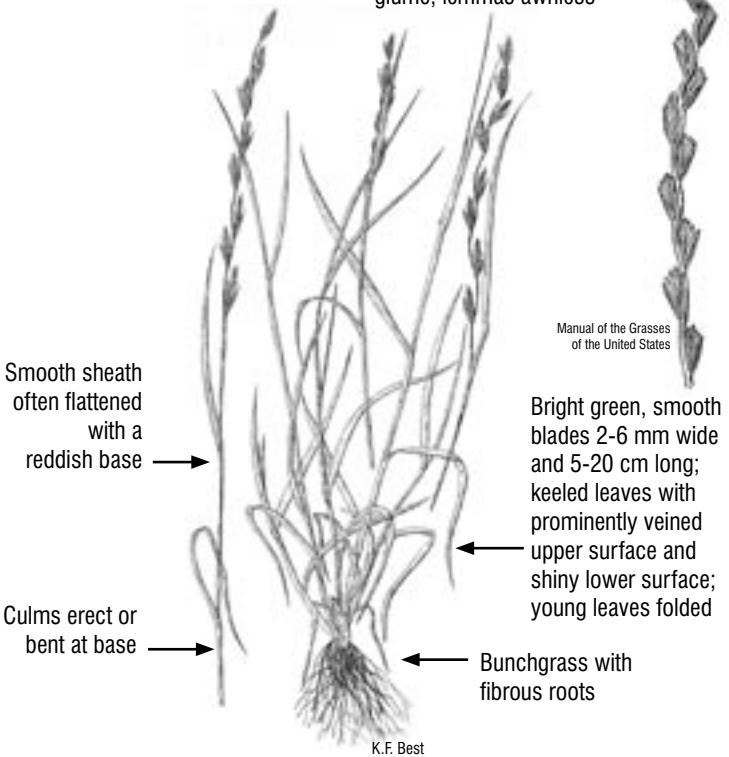
Manual of the Grasses of the United States

# Perennial Ryegrass

## *Lolium perenne*

- Culm 20-80 cm, spike 5-30 cm
- Moist, fertile sites on a wide range of soil and drainage conditions
- Introduced
- Pasture, hay, and soil stabilization

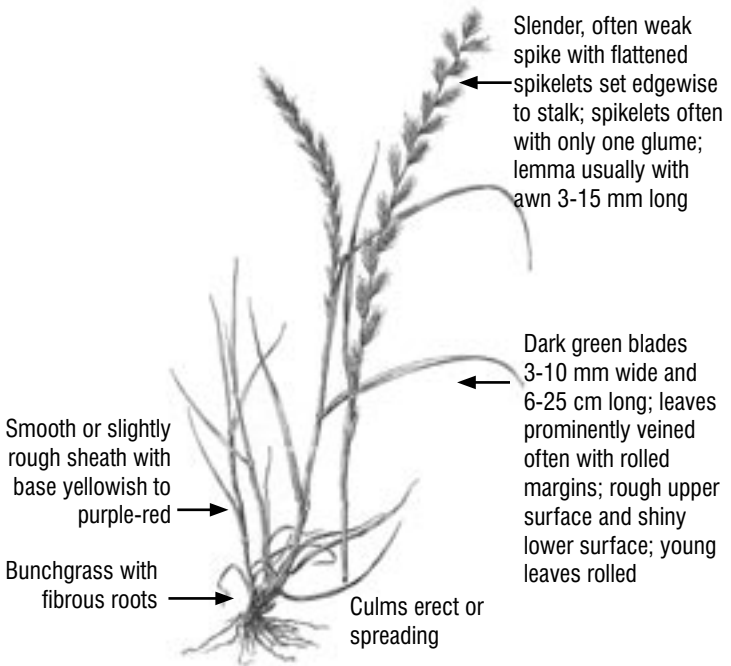
Slender, stiff spike often nodding with flattened spikelets set edgewise to stalk; spikelets often with only one glume, lemmas awnless



# Annual Ryegrass

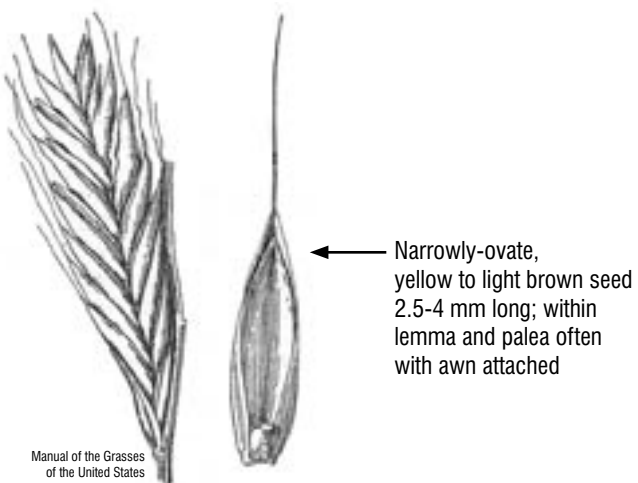
## *Lolium multiflorum*

- Culm 30-100 cm, spike 10-30 cm
- Moist, fertile sites on a wide range of soil and drainage conditions
- Annual or biennial
- Coarser than perennial ryegrass
- Introduced
- Pasture, hay, cover crop, and soil stabilization



Usually well-developed, claw-like auricles 1.5 mm

Ligule 0.5-2 mm



# Meadow Foxtail

## *Alopecurus pratensis*

- Culm 30-100 cm, panicle 3-10 cm
- Moist to wet sites growing best on fertile soils; flood tolerant
- Introduced
- Pasture and hay

Cylindrical, dark green to black panicle 5-10 mm wide; flattened spikelets with purple to orange anthers

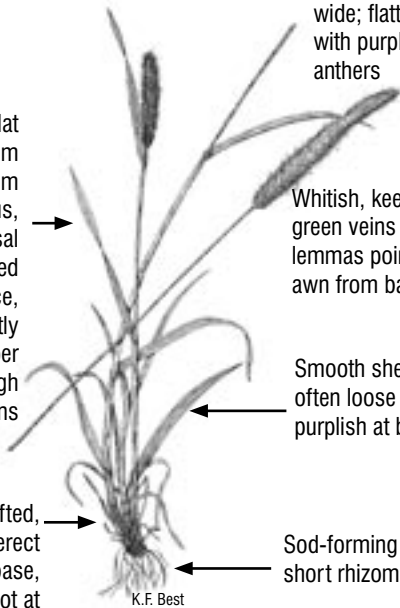
Dark green, flat blades 2-10 mm wide and 5-15 cm long; numerous, mostly basal leaves; keeled lower surface, rough, distinctly veined upper surface, and rough margins

Whitish, keeled glumes with green veins and silky hairs; lemmas pointed with bent awn from base 5-10 mm long

Smooth sheath often loose and purplish at base

Loosely tufted, robust culms erect or spreading at base, stems may root at lower nodes

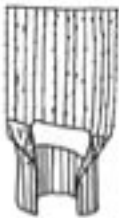
Sod-forming with short rhizomes



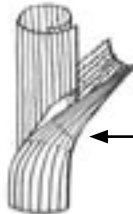
K.F. Best

Auricles absent

Coarse ligule  
1-3 mm;  
hair-fringed



K.F. Best



Yellowish collar

Gray, ovate, hairy seed 1-1.2 mm long pointed at both ends; within lemma, palea, and glumes with bent awn attached



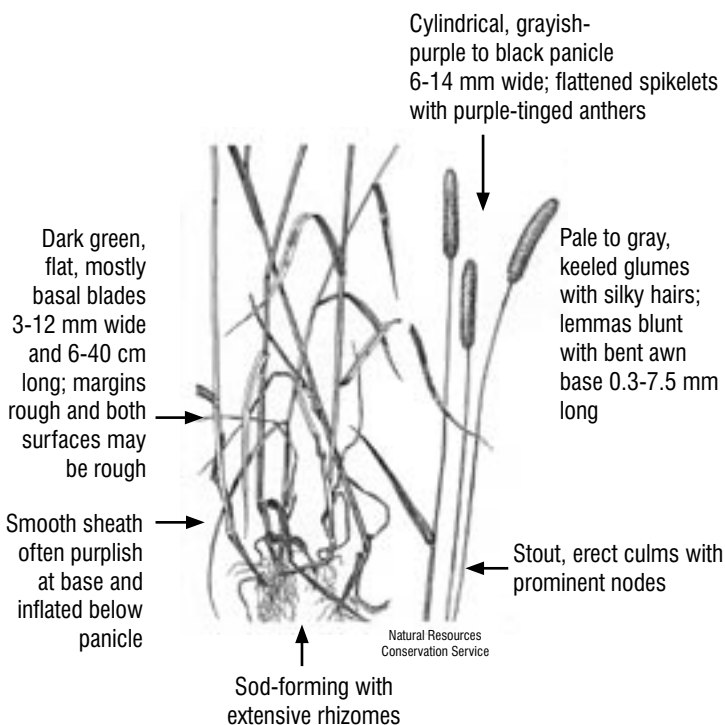
Manual of the Grasses  
of the United States



# Creeping Foxtail

## *Alopecurus arundinaceus*

- Culm 30-135 cm, panicle 4-10 cm
- Wide range of moist soils; flood and saline tolerant
- Introduced
- Pasture, hay, and soil stabilization



Greenish ligule  
1.5-5 mm

Auricles  
absent



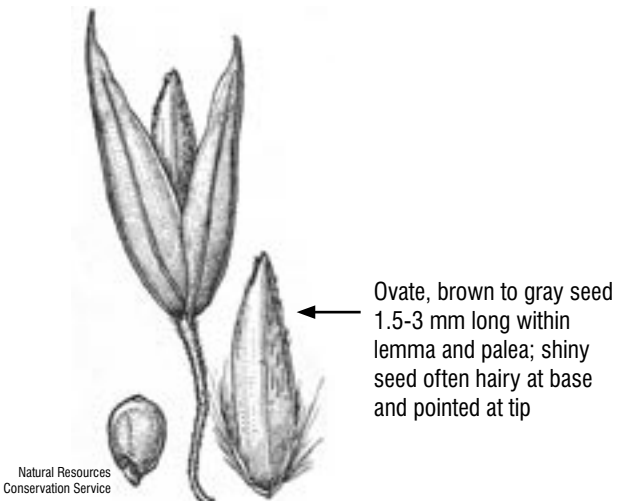
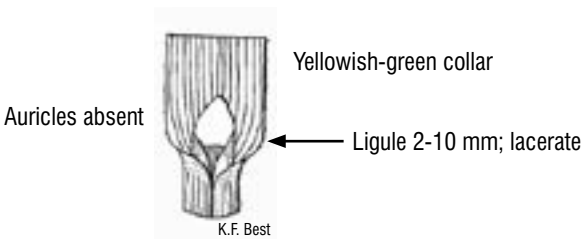
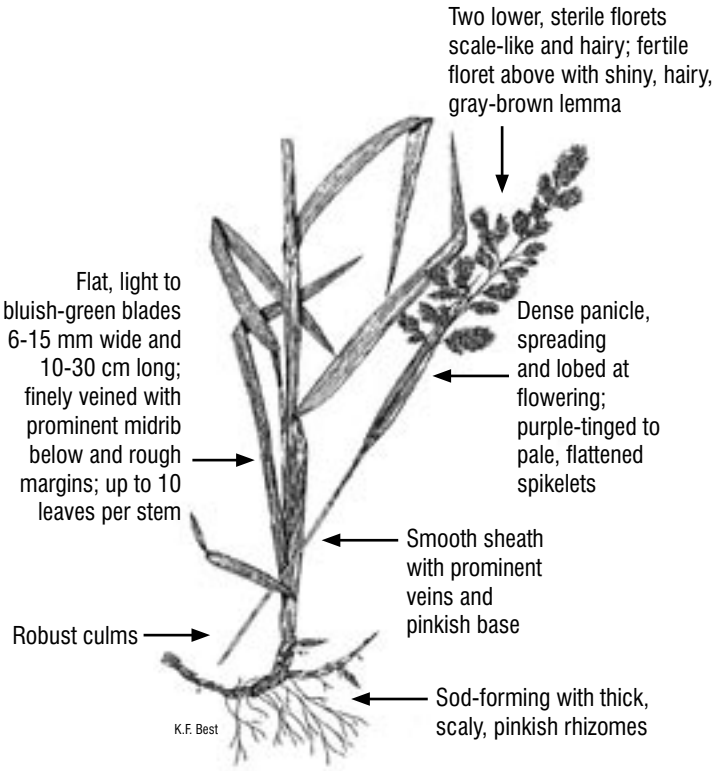
Gray to black, ovate, hairy seed 1-2 mm long pointed at both ends; within lemma, palea, and glumes and may have bent awn attached

Natural Resources  
Conservation Service

# Reed Canary Grass

## *Phalaris arundinacea*

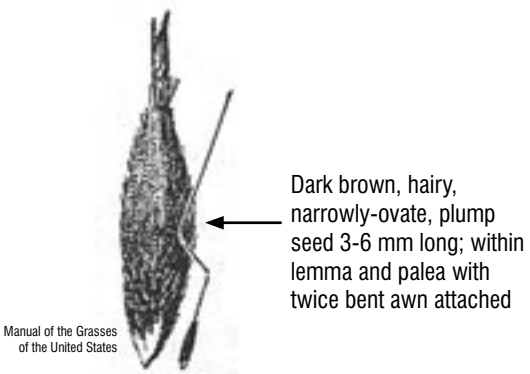
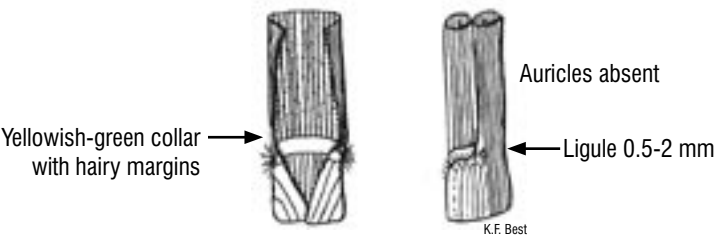
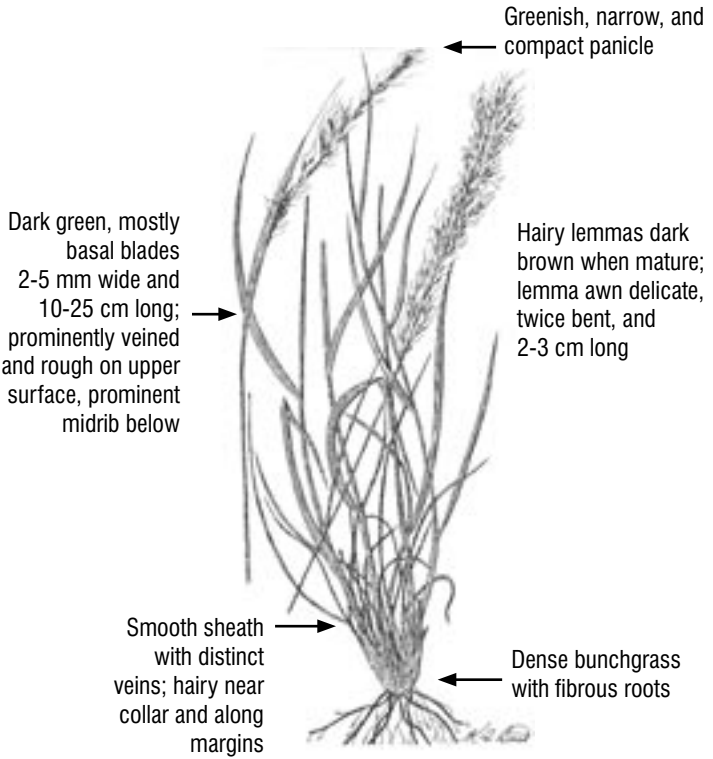
- Culm 60-200 cm, panicle 10-20 cm
- Moist to wet sites or areas with > 500 mm/year precipitation; tolerates flooding
- Native or introduced, invasive in water ways
- Hay, pasture, and soil stabilization



# Green Needle Grass

## *Stipa viridula*

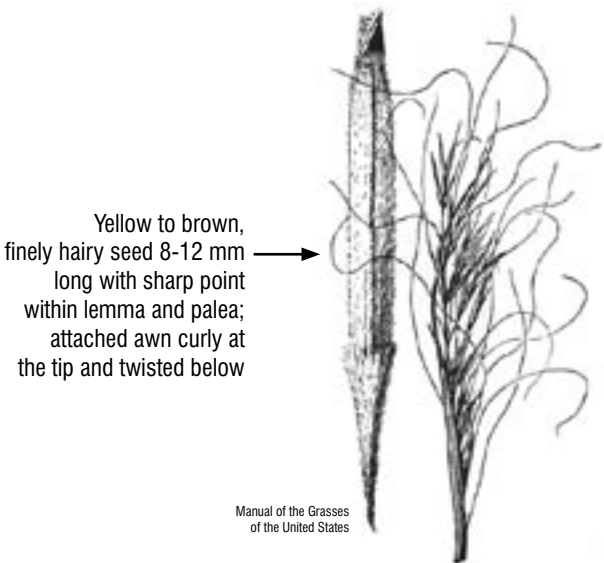
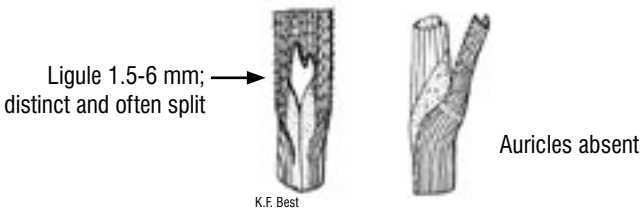
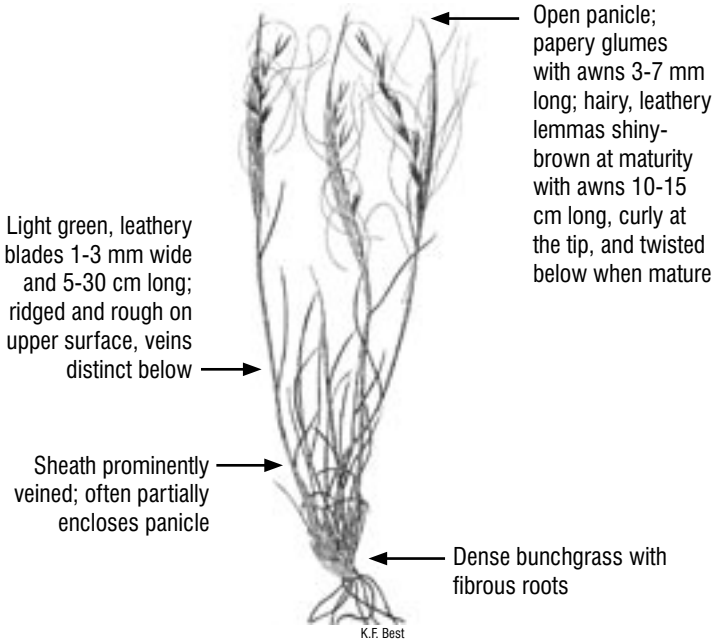
- Culm 50-100 cm, panicle 10-20 cm
- Moist to dry, fertile soils
- Native
- Reclamation, pasture, and hay



# Needle and Thread

## *Stipa comata*

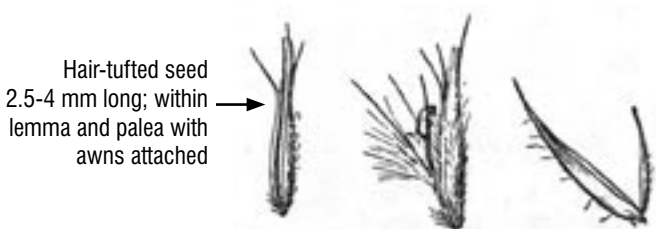
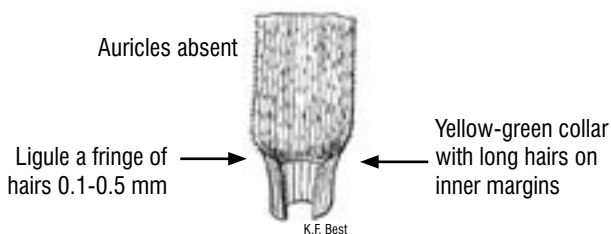
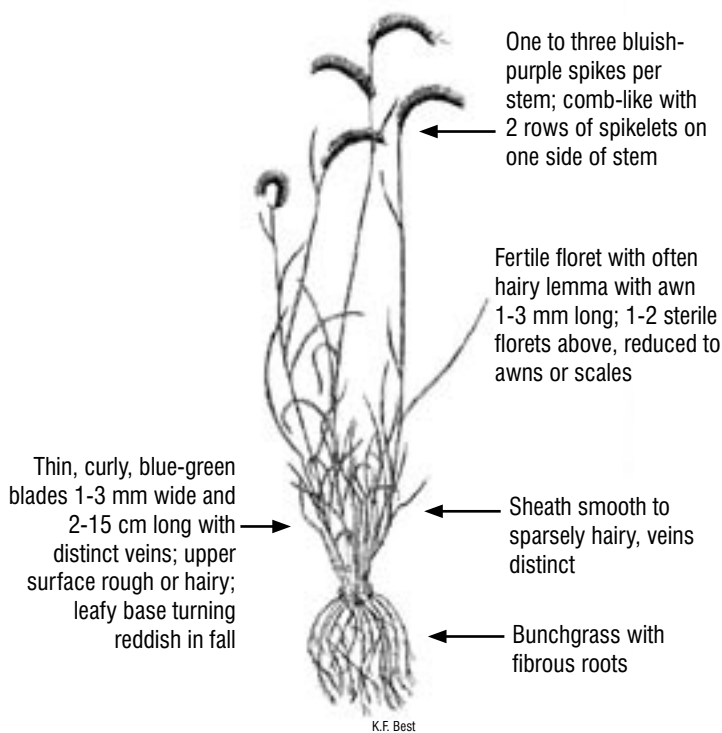
- Culm 30-60 cm, panicle 10-20 cm
- Wide range of soils except heavy clays; drought tolerant
- Native
- Reclamation and pasture
- Saskatchewan provincial grass



# Blue Grama

## *Bouteloua gracilis*

- Culm 10-50 cm, spike 2.5-5 cm
- Well-drained soils; drought tolerant
- Warm-season species
- Native
- Reclamation and pasture

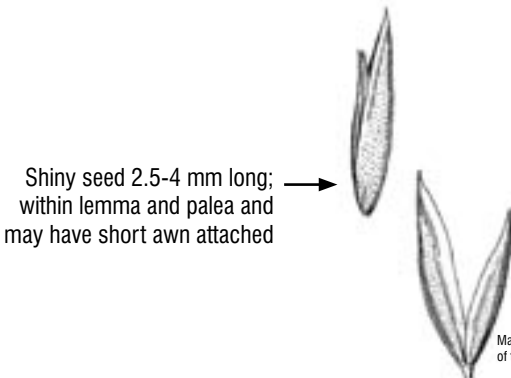
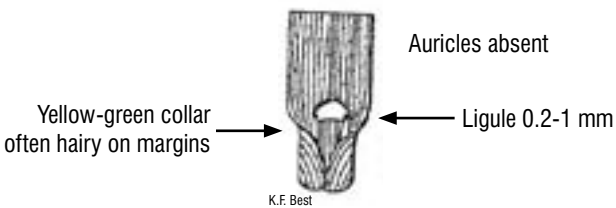
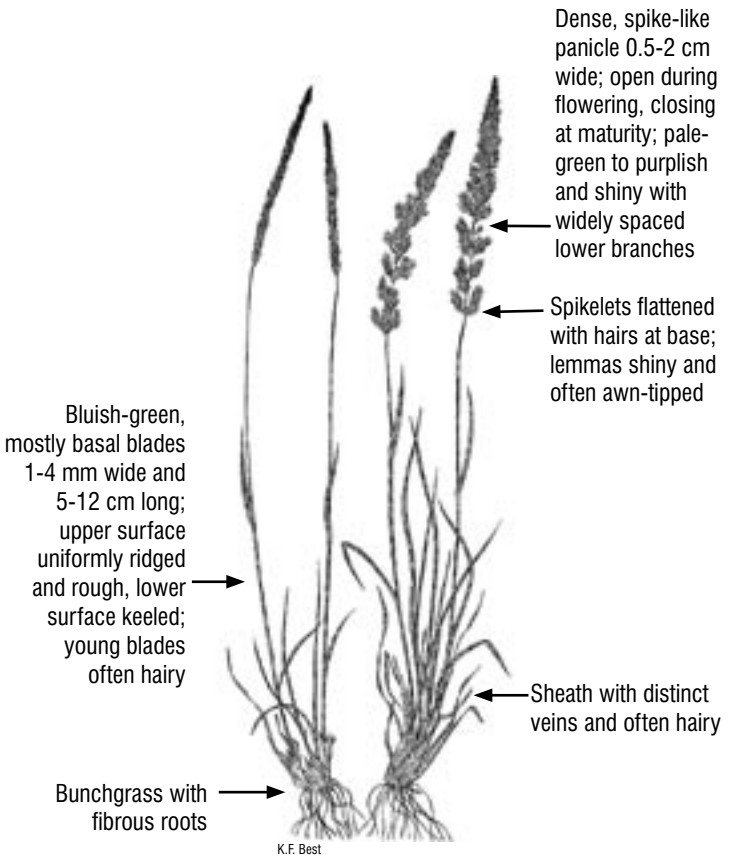


Manual of the Grasses  
of the United States

# June Grass

## *Koeleria macrantha*

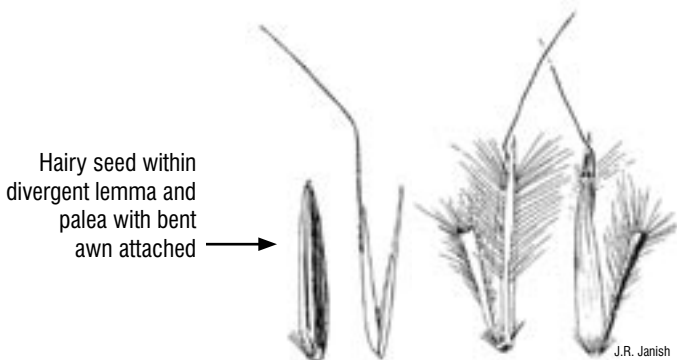
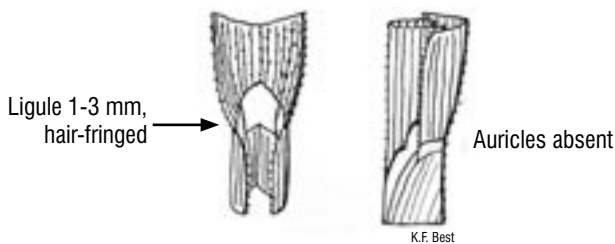
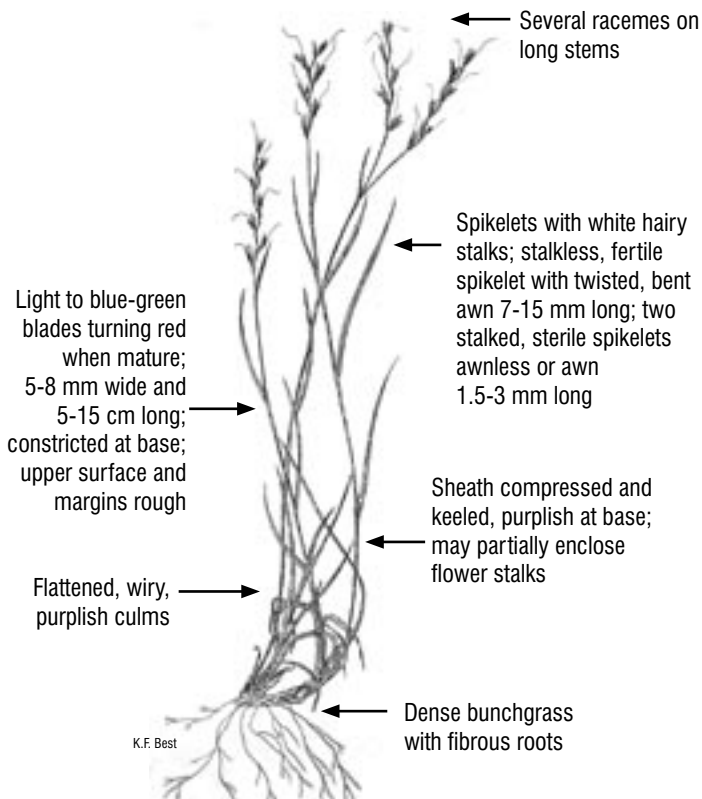
- Culm 10-50 cm, panicle 3-10 cm
- Well-drained, dry to moderately moist soils
- Native
- Reclamation and pasture



# Little Bluestem

## *Andropogon scoparius*

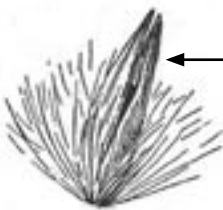
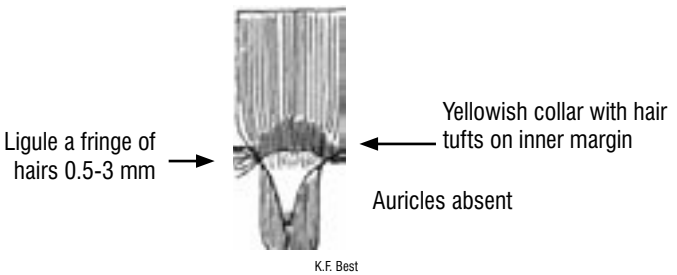
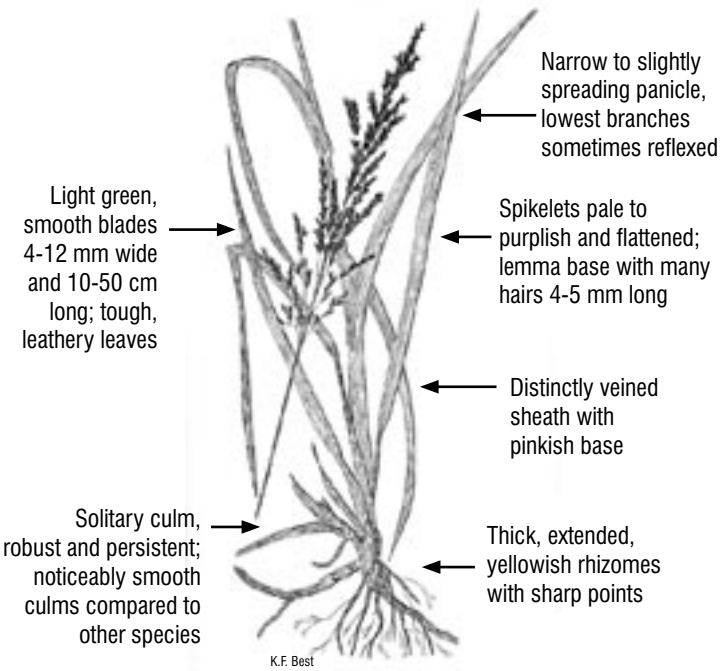
- Culm 30-70 cm, racemes 3-6 cm
- Dry, well-drained, often exposed sites and coarse low fertility soils
- Warm-season species
- Native
- Reclamation



# Sand Reed Grass

## *Calamovilfa longifolia*

- Culm 50-150 cm, panicle 15-35 cm
- Sandy soils; drought tolerant
- Warm-season species
- Native
- Reclamation, soil stabilization, and pasture



Linear, yellow seed 3-7 mm long with many white hairs at base at least 1/2 as long as seed; within lemma and palea

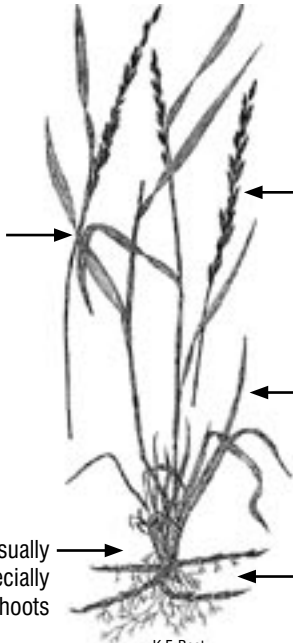


# GRASSY WEEDS

## **Quackgrass** *Agropyron repens*

- Culm 50-100 cm, spike 5-15 cm
- Moist, fertile, often disturbed soils
- Introduced, invasive in natural areas and disturbed sites
- Noxious weed; hay, pasture, and soil stabilization

Thin blades 6-10 mm wide and 6-20 cm long, twisted and often a constriction near tip; sparsely hairy above and with fine white lines below; upper surface and margins rough; large variance in hair but more so in young plants



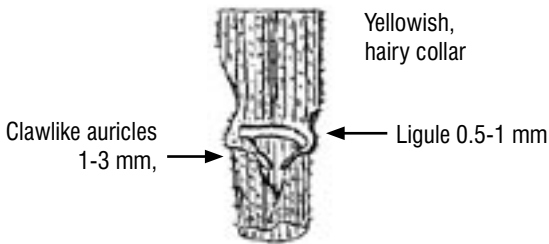
Spikelets loosely overlapping on spike; glumes awn-tipped, lemma awns 2-8 mm long

Culms loosely tufted or solitary; erect or spreading

Lower sheaths usually hairy, especially young shoots

Sod-forming with extended, yellowish-white rhizomes

K.F. Best



Yellowish, hairy collar

Clawlike auricles 1-3 mm,

Ligule 0.5-1 mm

K.F. Best



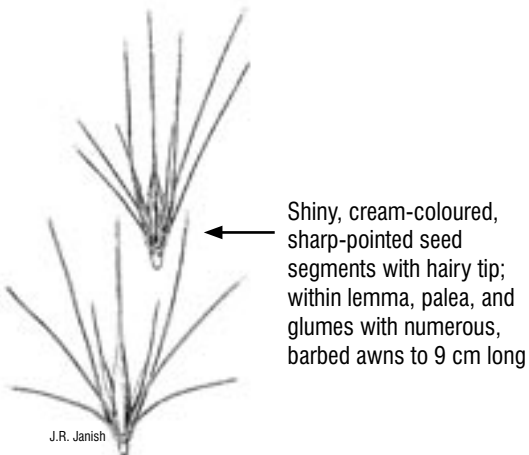
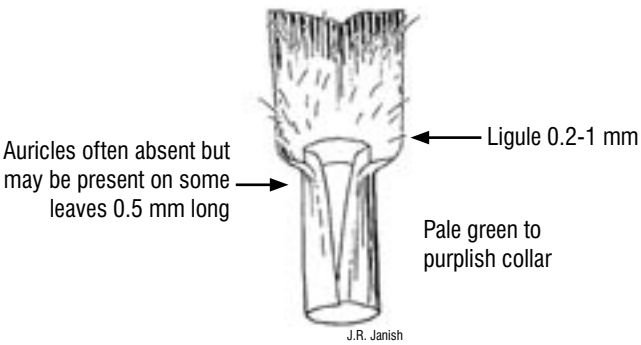
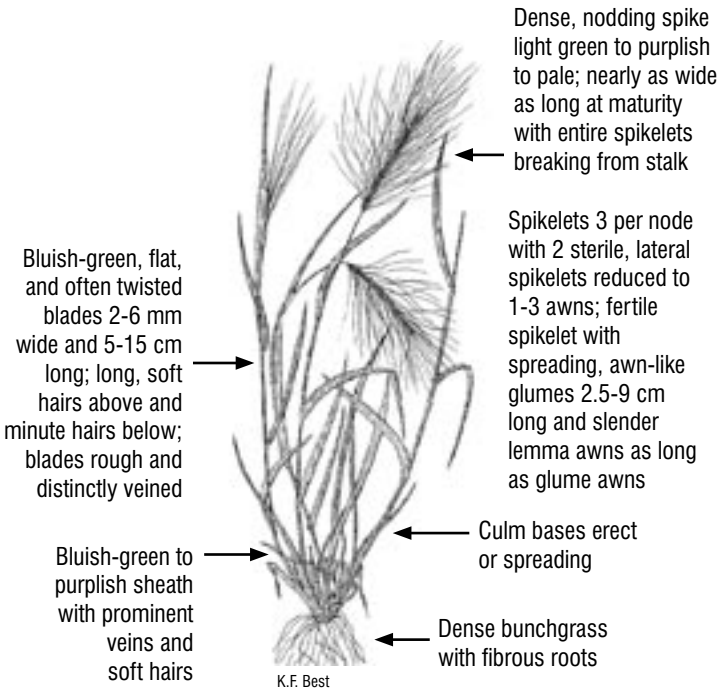
Smooth, linear, yellow seed 5-10 mm long with hairy tip; within lemma and palea often with awn attached

W.H. Wright

# Foxtail Barley

## *Hordeum jubatum*

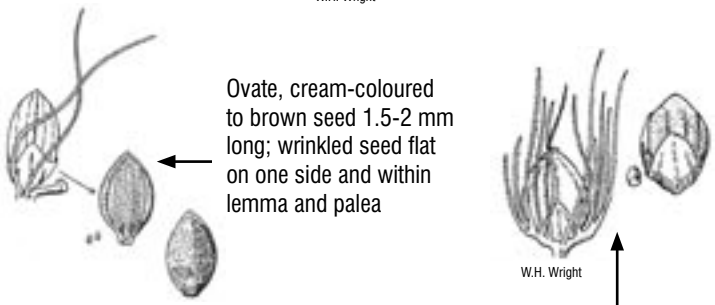
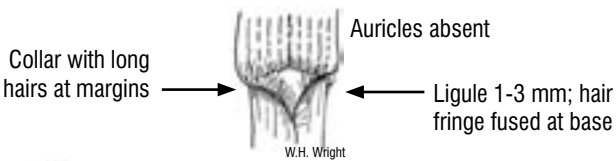
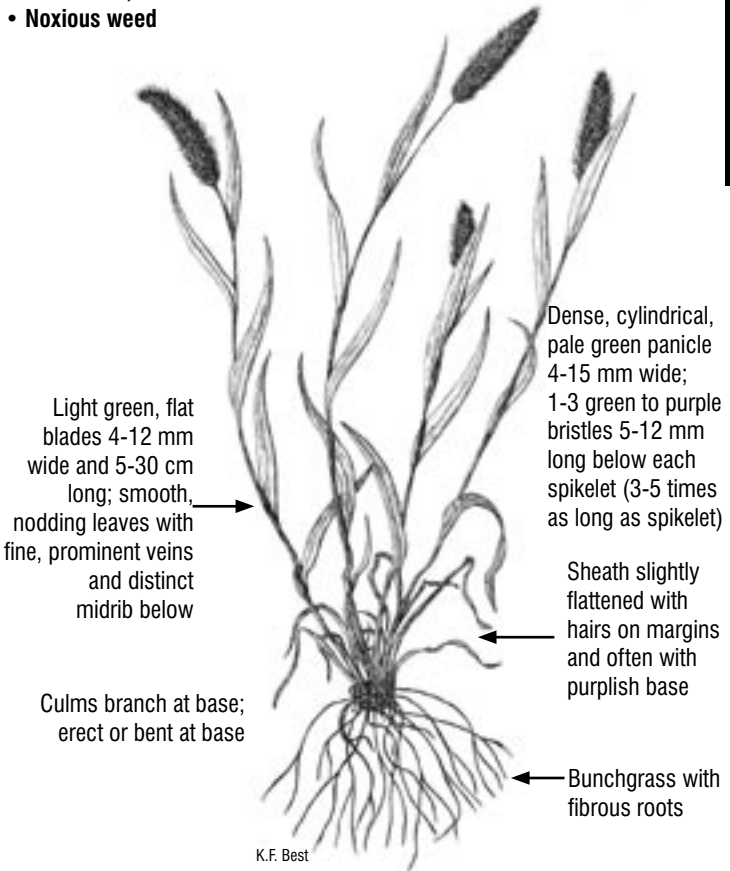
- Culm 30-80 cm, spike 5-10 cm
- Sloughs, disturbed sites, and moist, saline areas; tolerates some flooding and saline conditions
- Pasture prior to heading out



# Green Foxtail

## *Setaria viridis*

- Culm 10-60 cm, panicle 1-10 cm
- Moist soils, prefers warm, bright sites; fields, roadsides, and disturbed sites
- Annual
- Warm-season species
- Introduced, invasive
- Noxious weed



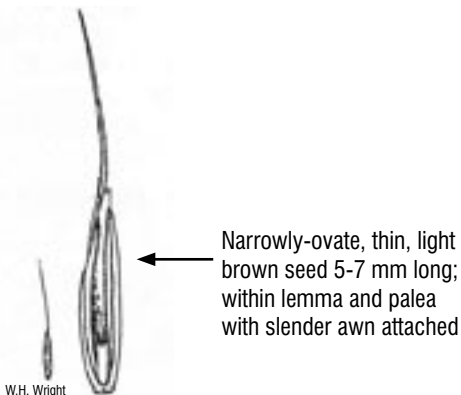
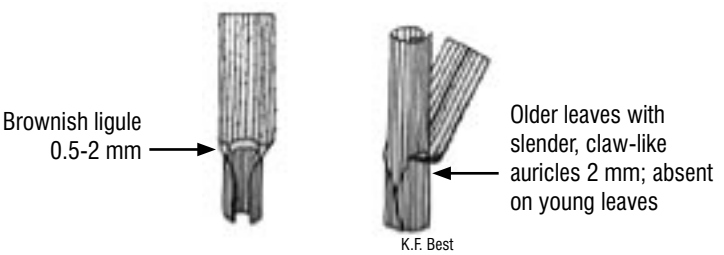
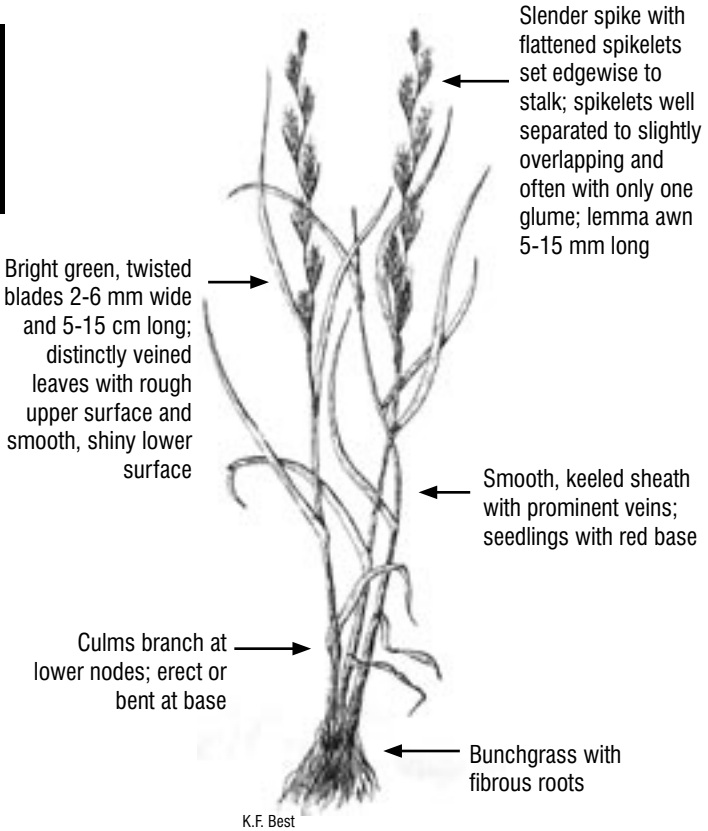
### Similar Species: Yellow foxtail (*S. glauca*)

- culm 30-100 cm, panicle 3-10 cm
- sheath sharply keeled with distinct veins without hairy margins
- loosely twisted blade flat to V-shaped with long, twisted hairs near base
- panicle yellow when mature with 5-20 yellow to purple bristles 3-12 mm long below each spikelet (2-3 times as long as spikelet)
- yellowish seed 2.5-3.3 mm long with more distinct wrinkles

# Persian Darnel

## *Lolium persicum*

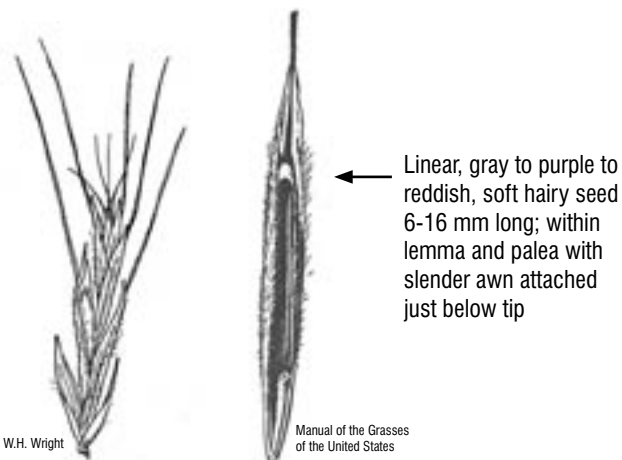
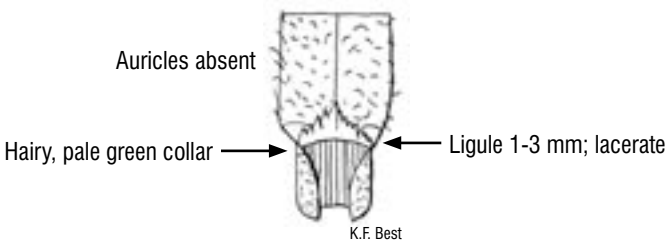
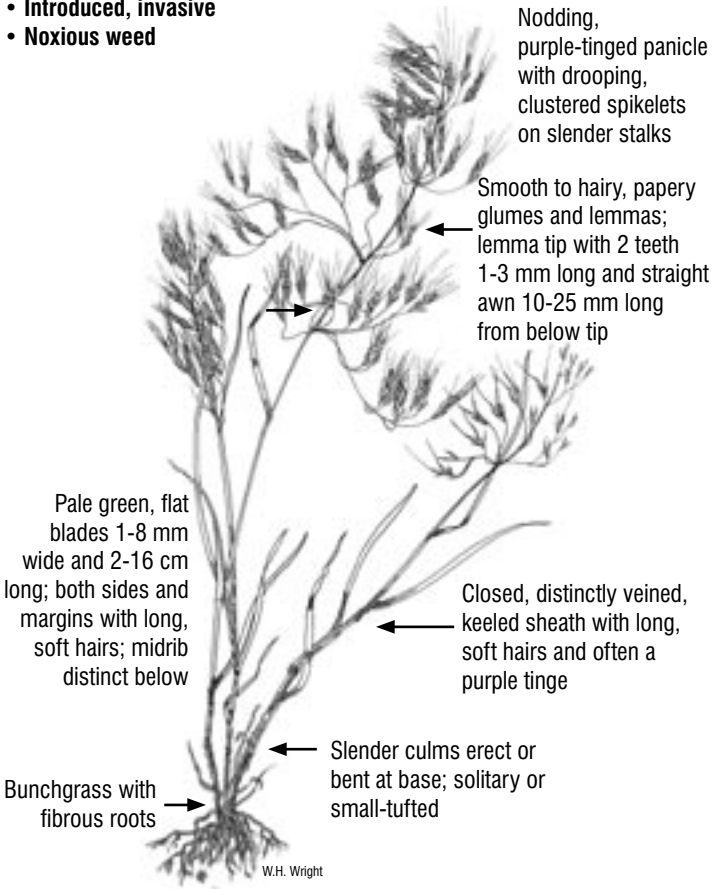
- Culm 15-60 cm, spike 3-15 cm
- Fields and disturbed sites
- Annual
- Introduced, invasive
- Noxious weed



# Downy Brome / Cheatgrass

## *Bromus tectorum*

- Culm 20-60 cm, panicle 5-20 cm
- Overgrazed pastures, roadsides, fields, and disturbed sites; drought tolerant
- Annual or winter annual
- Introduced, invasive
- Noxious weed



# Japanese Brome

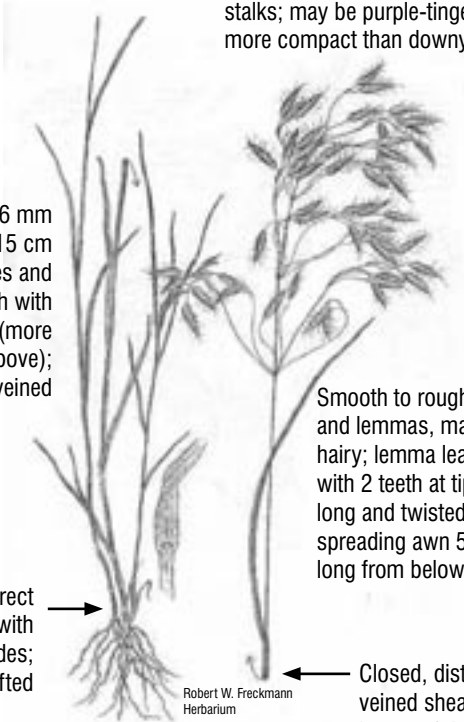
## *Bromus japonicus*

- Culm 20-70 cm, panicle 10-20 cm
- Overgrazed pastures, roadsides, fields, and disturbed sites; often on moist sites; drought tolerant
- Annual or winter annual
- Introduced, invasive
- Noxious weed

Nodding panicle with spreading or drooping spikelets at tips of slender stalks; may be purple-tinged and more compact than downy brome

Flat blades 1-6 mm wide and 4-15 cm long; both sides and margins rough with long, soft hairs (more so above); prominently veined

Slender culms erect or bent at base with long hairs at nodes; solitary or tufted



Bunchgrass with fibrous root

Smooth to rough glumes and lemmas, may be hairy; lemma leathery with 2 teeth at tip 0-1 mm long and twisted, often spreading awn 5-15 mm long from below tip

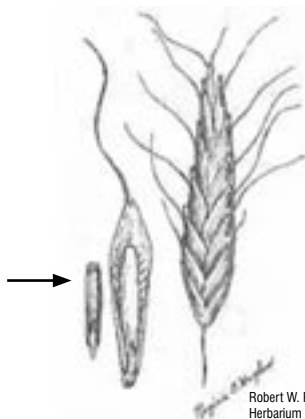
Closed, distinctly veined sheath with long, soft hairs and often a purple tinge

Hairy, pale green to brown collar

Auricles absent

Ligule 0.5-2 mm; lacerate with silky hairs

Tan-coloured seed may be hairy; within lemma and palea with slender, twisted, spreading awn attached just below tip; seed shorter than downy brome



Robert W. Freckmann Herbarium

# Barnyardgrass

## *Echinochloa crus-galli*

- Culm 30-120 cm, panicle 5-25 cm
- Prefers moist, rich soils but grows in all soils; fields, roadsides, and disturbed sites
- Annual
- Warm season species
- Introduced, invasive

Stout, dense racemes erect or drooping with maturity; greenish-purple racemes may be branched; main stalk with hairy nodes

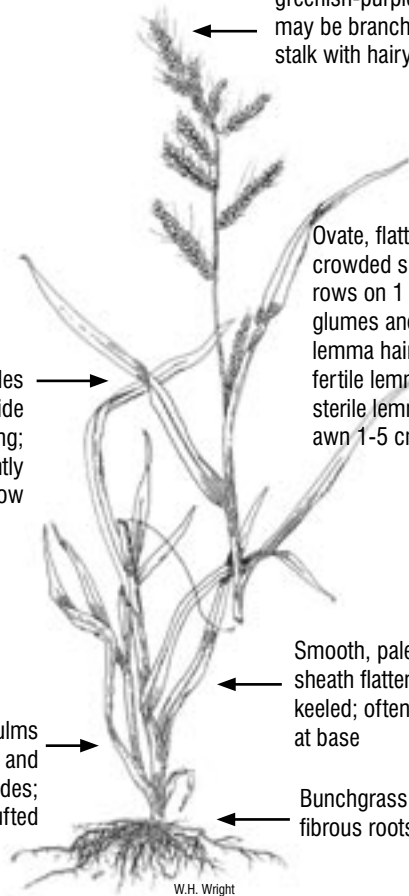
Ovate, flattened, and crowded spikelets in 2 rows on 1 side of stalk; glumes and lower, sterile lemma hairy but upper, fertile lemma smooth; sterile lemmas often with awn 1-5 cm long

Pale-green blades 5-20 mm wide and 8-35 cm long; smooth to slightly rough; keeled below

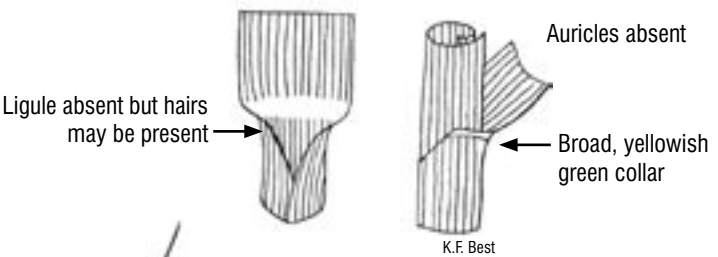
Smooth, pale green sheath flattened and keeled; often reddish at base

Smooth, stout culms spreading to erect and may root at nodes; solitary or small-tufted

Bunchgrass with fibrous roots



W.H. Wright



K.F. Best



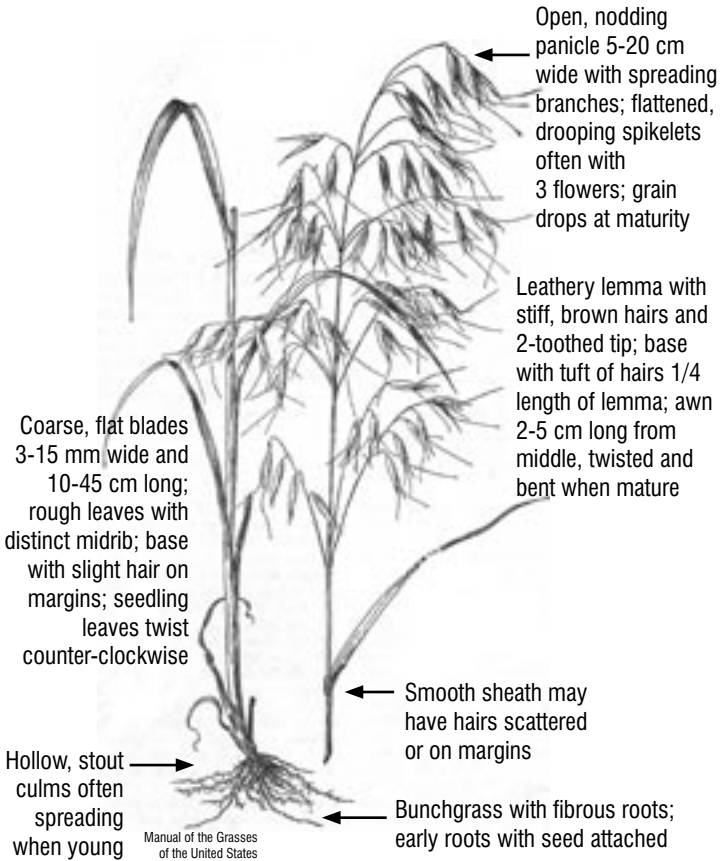
Shiny, ovate, plump seed 1.3-2.2 mm long; yellow to gray-brown seed flat on one side, tight within lemma and palea, and may have awn attached

W.H. Wright

# Wild Oat

## *Avena fatua*

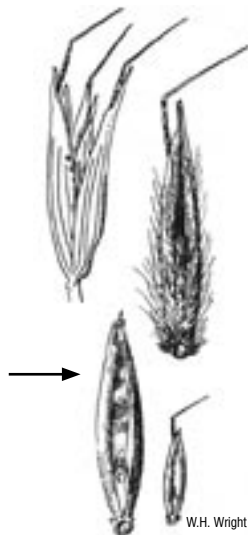
- Culm 30-160 cm, panicle 10-40 cm
- Prefers cool, moist soils; fields, roadsides, and disturbed sites
- Annual
- Introduced, invasive
- Noxious weed



Auricles absent

Ligule 4-6 mm; pointed and split

Yellow to brown to black, often hairy seed 6-15 mm long with circular scar at base; within lemma and palea with twisted, bent awn attached



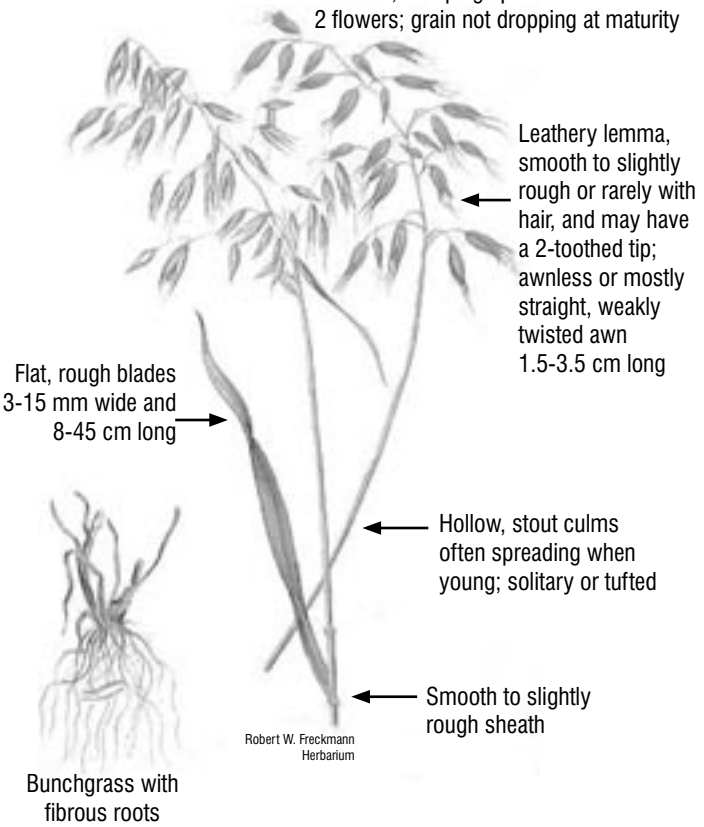


# Oat

## *Avena sativa*

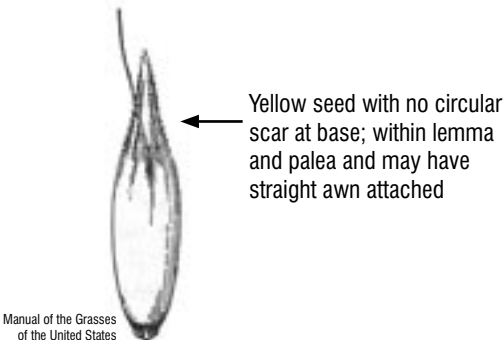
- Culm 40-180 cm, panicle 20-40 cm
- Annual crop, soil stabilization
- Introduced
- Occasionally invasive

Open, nodding panicle 5-15 cm wide with spreading branches (less than wild oat); flattened, drooping spikelets often with 2 flowers; grain not dropping at maturity



Auricles absent

Ligule 2-6 mm; pointed and split



# Wheat

## *Triticum aestivum*

- Culm 50-150 cm, spike 4-12 cm
- Annual or winter annual crop, soil stabilization
- Introduced
- Occasionally invasive

GRASSY WEEDS

Dense spike with flattened spikelets well separated to overlapping; spikelets light green with dark green lines

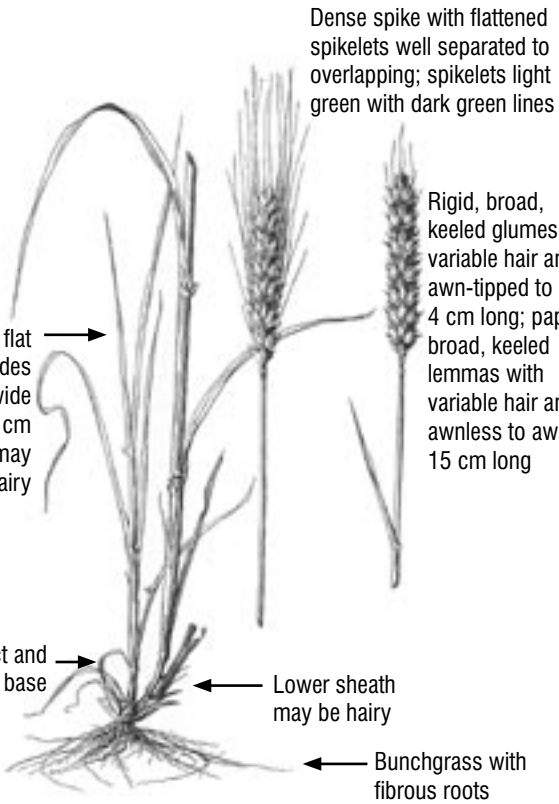
Rigid, broad, keeled glumes with variable hair and awn-tipped to awn 4 cm long; papery, broad, keeled lemmas with variable hair and awnless to awn to 15 cm long

Blue-green, flat blades 6-20 mm wide and 10-60 cm long; may be hairy

Culms erect and branching at base

Lower sheath may be hairy

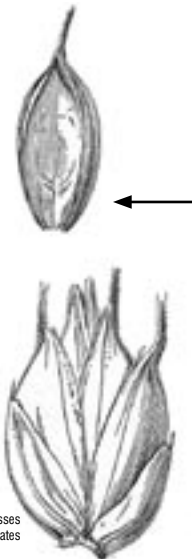
Bunchgrass with fibrous roots



White ligule 1 mm

Hairy, well-developed auricles 3 mm

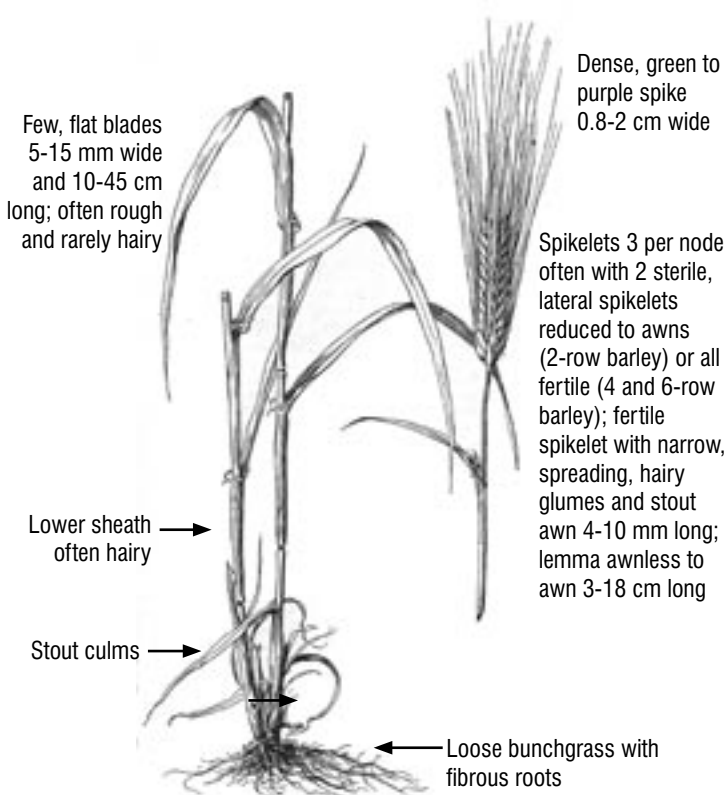
Yellow to red-brown, ovate, plump seed 5-9 mm long within lemma and palea; hairy at blunt tip with distinct groove on one side



# Barley

## *Hordeum vulgare*

- Culm 30-120 cm, spike 2-10 cm
- Annual crop
- Introduced
- Occasionally invasive



Well-developed, white auricles 4.5-6 mm

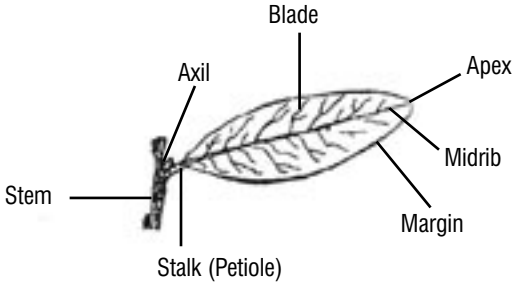
White, split ligule 0.5-2 mm

Yellow, short-pointed, ovate seed 7.5-12.5 mm long often within lemma and palea; hairy at tip with distinct groove on one side

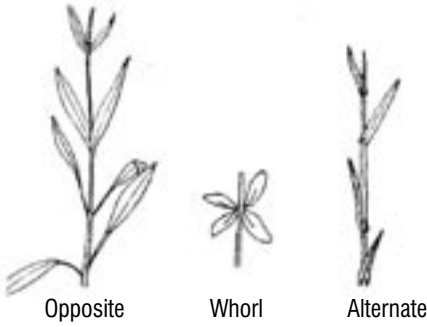


# Leaf Morphology of Forbs and Shrubs

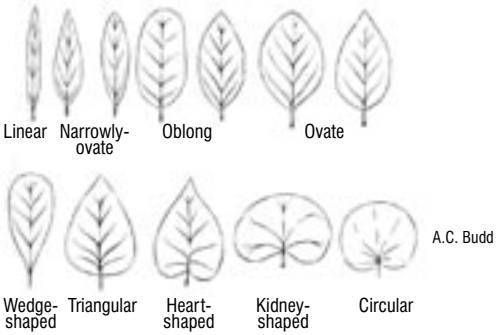
## Leaf Parts



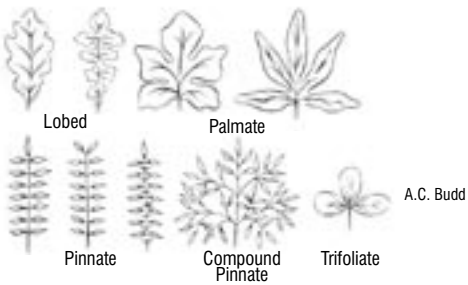
## Leaf Arrangements



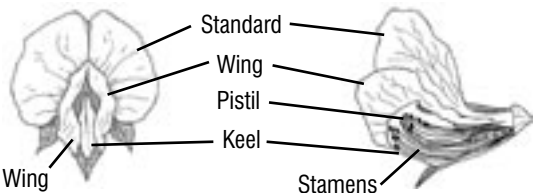
## Examples of Simple Leaves



## Examples of Divided Leaves



## Basic Flower Structure of Legumes



# Alfalfa

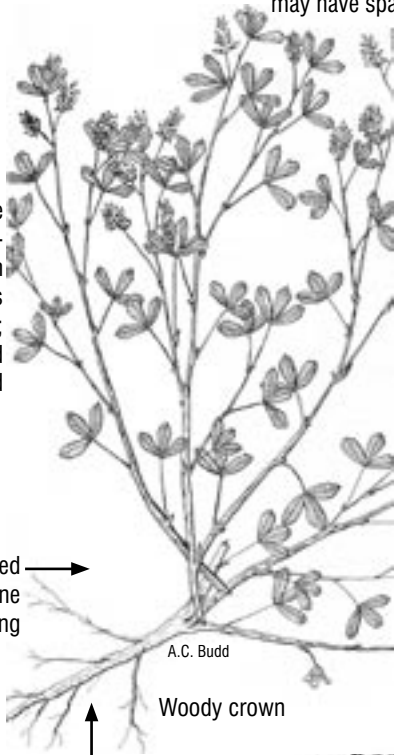
## *Medicago sativa*

- 30-100 cm tall
- Grows best in well-drained, loamy soils but adapted to a variety of soil types; drought tolerant
- Introduced, occasionally invasive
- Hay, pasture, and soil stabilization

Linear stipules 4-12 mm long united at base; may be toothed and may have sparse hairs

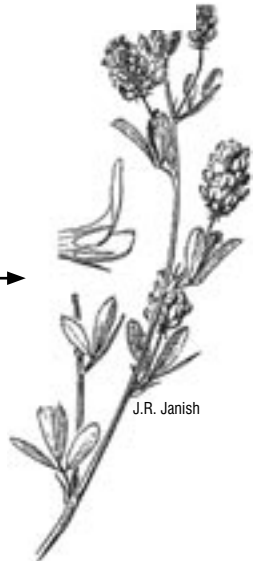
Numerous, alternate leaves with 3 narrowly-ovate leaflets 10-35 mm long; dark green leaflets with sharp teeth at tip; lower surface hairy and terminal leaflet stalked

Much-branched, ridged stems may have fine hair; erect to spreading



Deep, branched taproot or extensive rhizomes (variety dependent)

Several blue, purple, yellow, or whitish flowers 5-11 mm long in dense, axillary heads 10-45 mm long; flowers within tubular sepals with long teeth



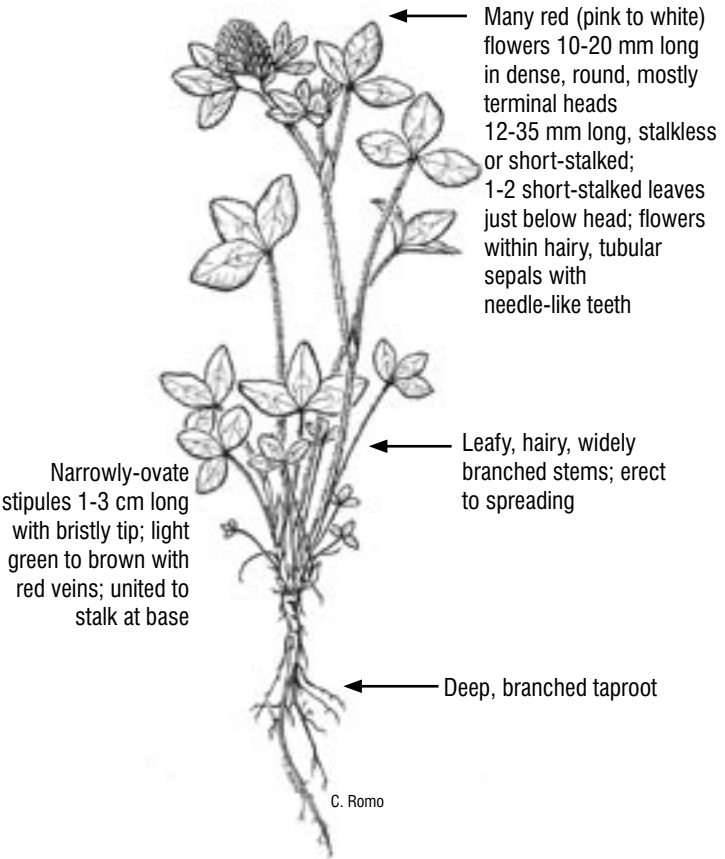
Yellow, olive-green, or brown, kidney-shaped, shiny seeds 2-3 mm long in brown pods coiled, curved, or straight up to 15 mm long; pods may be hairy with 3-10 seeds

# Red Clover

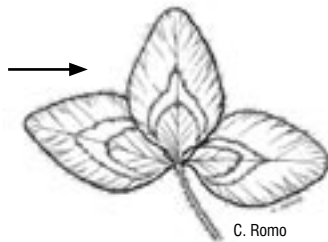
## *Trifolium pratense*

- 20-80 cm tall
- Moist sites; grows best with > 400 mm/year precipitation
- Biennial or short-lived perennial
- Introduced
- Hay and pasture

LEGUMES



Alternate leaves with 3 ovate, finely toothed leaflets 1-5 cm long and 0.5-1.5 cm wide; leaflets with slight hair and often a pale, inverted 'V' above; lower leaves long-stalked and upper leaves short-stalked to stalkless

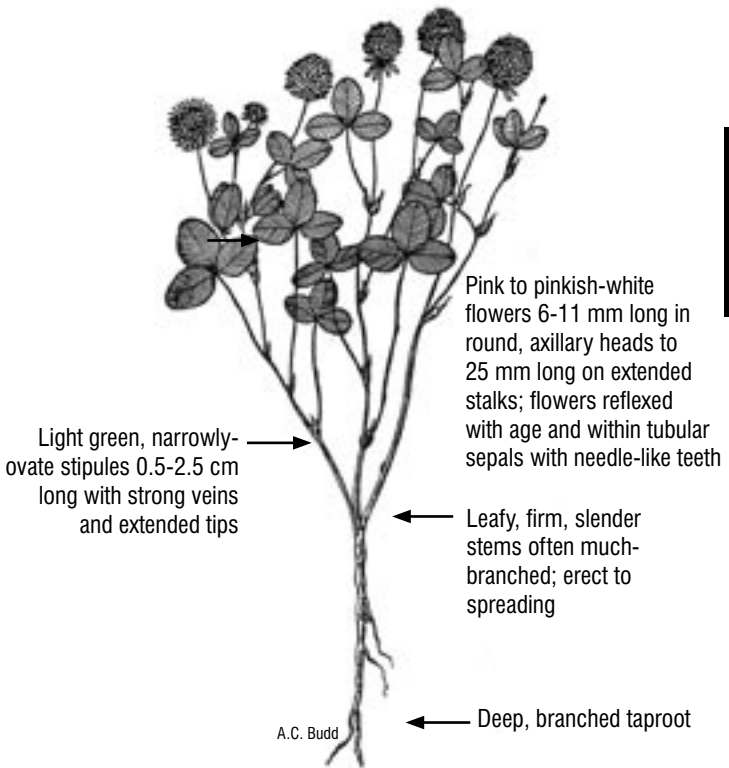


Straw-coloured, brown, or purple, kidney-shaped seeds 1.5-2.5 mm long in oblong pods 2 mm long with 1 or 2 seeds; shiny seeds with a notch on one side

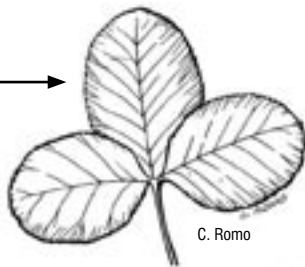
# Alsike Clover

## *Trifolium hybridum*

- 10-80 cm tall
- Adapted to poorly drained, moist sites; grows best with > 400 mm/year precipitation
- Short-lived perennial
- Introduced
- Hay and pasture



Alternate, dull green leaves with 3 ovate, finely toothed, smooth leaflets 1-4 cm long and 1-3 cm wide; leaves long-stalked except uppermost one



Dull green to black, heart-shaped seeds 1 mm long in oblong pods with 1-4 seeds

# Sweet Clover

## *Melilotus species*

Yellow Sweet Clover (*M. officinalis*)

White Sweet Clover (*M. alba*)

- 50-250 cm tall
- Grows well in a wide range of soils; drought tolerant; often in disturbed sites
- Biennial
- Introduced, invasive in natural areas
- Pasture, hay, and soil stabilization

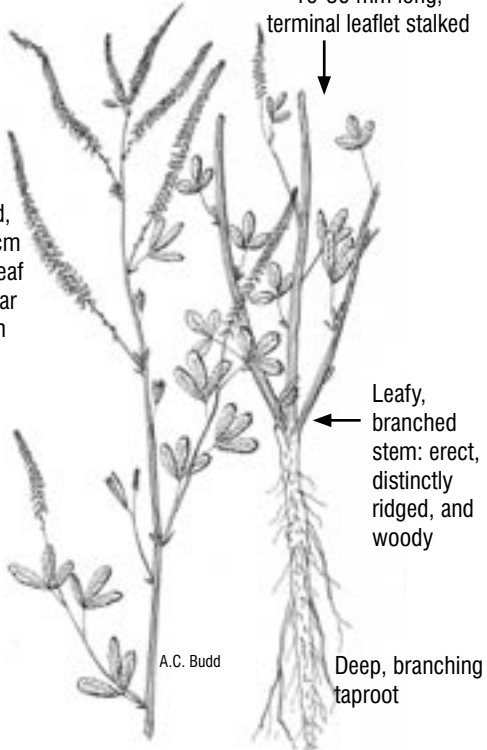
LEGUMES

Numerous yellow or white flowers 4-7 mm long in narrow, elongated, spike-like racemes 3-20 cm long; limp racemes from leaf axils; flowers within tubular sepals with 5 linear teeth



J.R. Janish

Alternate leaves with 3 ovate, toothed leaflets 10-30 mm long; terminal leaflet stalked



A.C. Budd

Leafy, branched stem: erect, distinctly ridged, and woody

Deep, branching taproot

Stipules 5-10 mm long united to stalk at base; margins smooth or may have lobes or teeth

White sweet clover is more productive and has coarser stems and leaves. The white flowers are 4-5 mm long in racemes 5-20 cm long. Yellow sweet clover is more drought resistant, shorter (50-200 cm), and has more spreading growth. The yellow flowers are 4-7 mm long in racemes 3-15 cm long.



J.R. Janish

White sweet clover has yellow, kidney-shaped seeds 2-5 mm long in ovate, net-veined, slightly leathery pods 3-6 mm long with 1-2 seeds

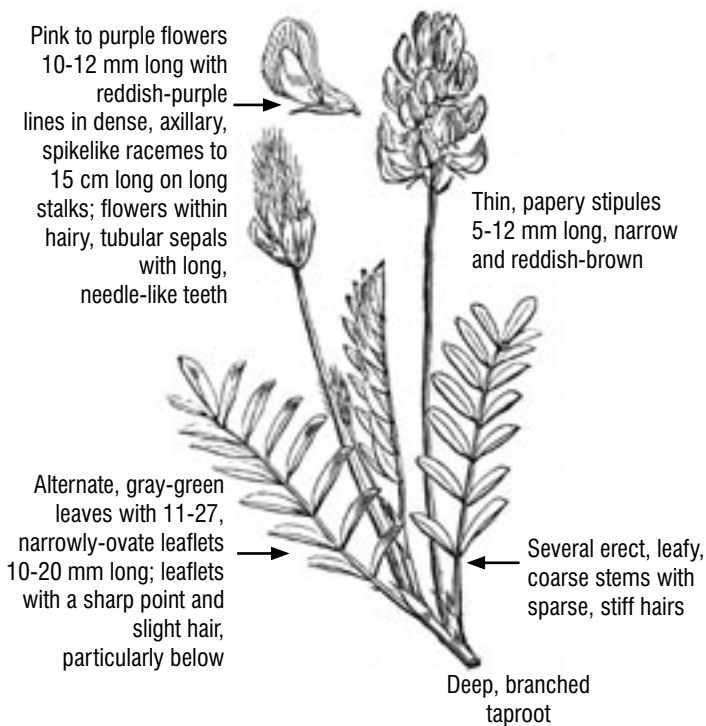
Yellow sweet clover has olive green, kidney-shaped seeds often with purple spots, 2-5 mm long in ovate, wrinkled, slightly leathery pods 3-5 mm long with 1-2 seeds



# Sainfoin

## *Onobrychis viciifolia*

- 20-100 cm tall
- Grows best with > 300 mm/year precipitation; drought tolerant but not flood tolerant
- Introduced
- Hay and pasture



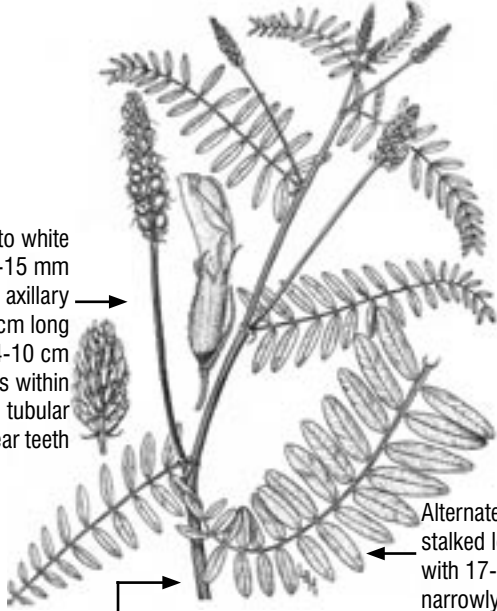
Olive-green, brown, or black, kidney-shaped to ovate seeds 3-6 mm long in ovate pods 6-8 mm long with 1 seed; hairy, leathery pods often with stout bumps or spines

# Cicer Milkvetch

## *Astragalus cicer*

- 40-120 cm tall
- Moist sites; grows best with > 400 mm/year precipitation; moderately drought tolerant
- Introduced
- Hay, pasture, and soil stabilization

Linear to narrowly triangular stipules 2-8 mm long with lower portion fused into a sheath

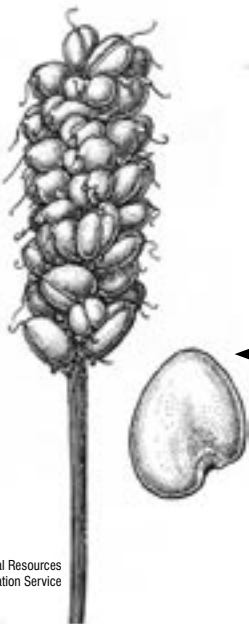


Pale yellow to white flowers 10-15 mm long in dense, axillary racemes 2-6 cm long on stalks 4-10 cm long; flowers within black hairy, tubular sepals with linear teeth

Alternate, short-stalked leaves with 17-33 narrowly-ovate leaflets 5-20 mm long; leaflets slightly hairy either side

Several leafy, succulent, coarse stems with soft hairs; spreading with age

Stout, extensive rhizomes



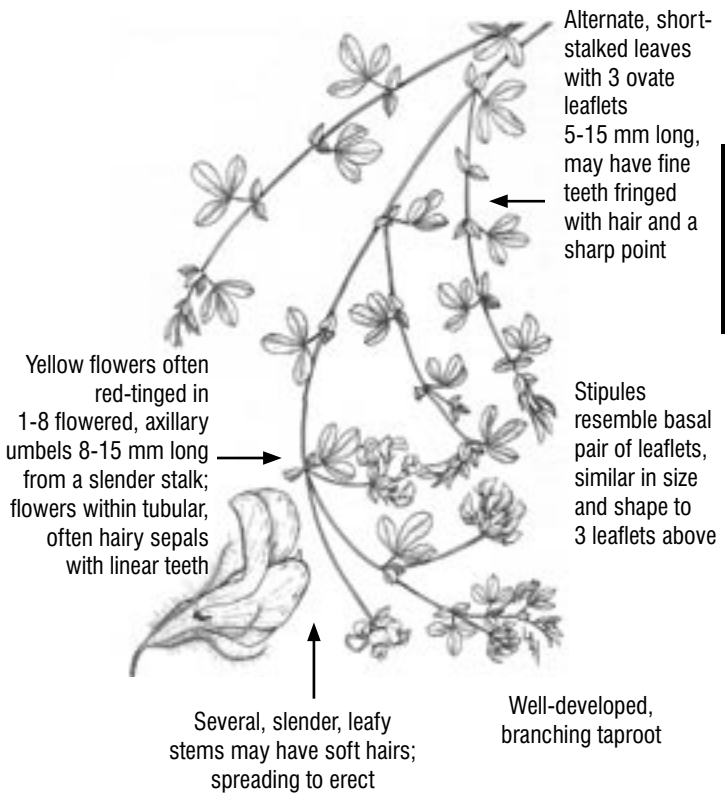
Yellow to pale green, flat, kidney-shaped seeds 2-3 mm long in ovate, inflated pods 7-15 mm long with 3-15 seeds; leathery, dark brown to black pods with black and white hairs and beaked tip

Natural Resources  
Conservation Service

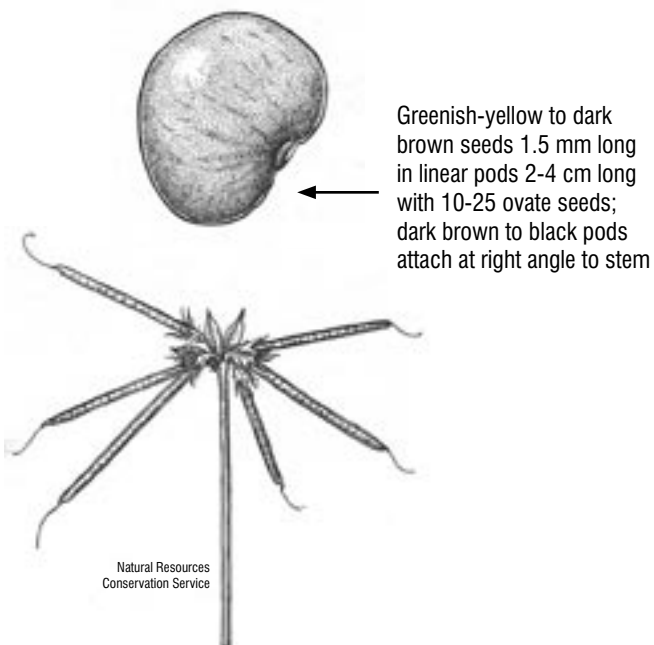
# Bird's-foot Trefoil

## *Lotus corniculatus*

- 10-60 cm tall
- Grows best with > 400 mm/year precipitation; tolerates flooding and low fertility
- Introduced
- Hay and pasture



LEGUMES



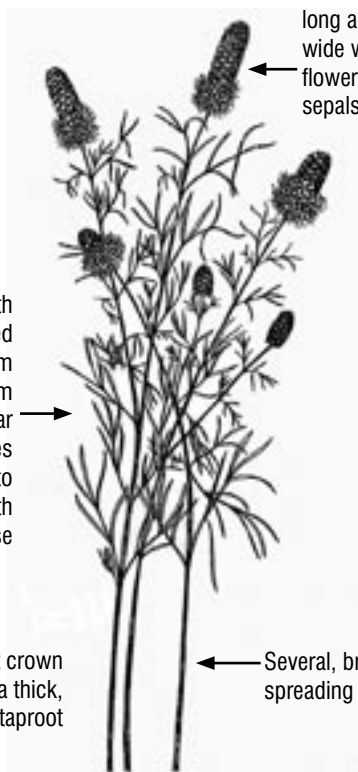
# Purple Prairie Clover

## *Petalostemon purpureum*

- 20-50 cm tall
- Moist to dry sites; prefers coarse soils but grows in most soil types
- Native
- Reclamation and pasture

LEGUMES

Dense, cylindrical, terminal spikes 1-5 cm long and 7-14 mm wide with many purple flowers 1 mm long; sepals densely hairy



Alternate leaves with 3-7 linear, rolled leaflets 5-20 mm long and 1-1.5 mm wide with glandular dots below; leaves slightly hairy to smooth with stipules at base

Compact crown from a thick, woody taproot

Several, branched stems, spreading to erect

K.F. Best

Olive green to brown, kidney-shaped seeds, often with pitted surface, 1.5-3 mm long in ovate pods, enclosed in bracts, with 1-2 seeds

Similar species: White Prairie Clover (*P. candidum*)

- white flowers in a dense spike 2-8 cm long, sepals with slight hair
- 5-9 linear leaflets 5-30 mm long and 2-3 mm wide, hairless

# SHRUBS

## **Winterfat** *Eurotia lanata*

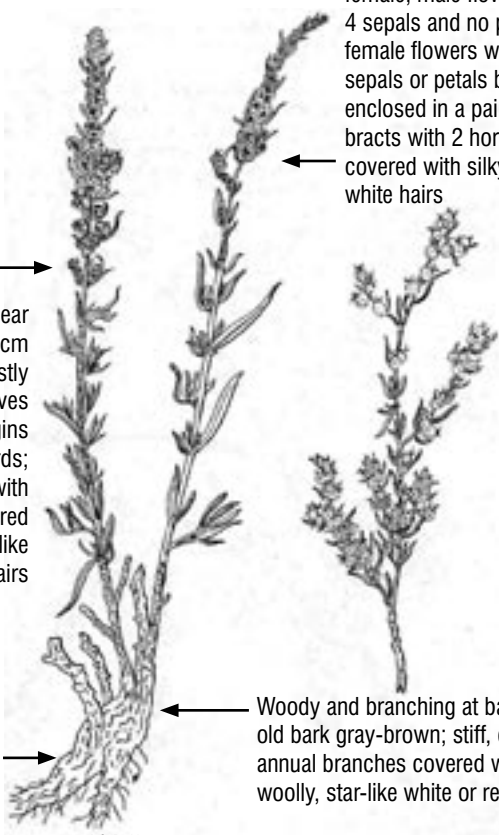
- 15-50 cm tall
- Grows in most soil types; drought and saline tolerant
- Native
- Reclamation and pasture

Axillary clusters of 2-4 flowers with male above female; male flowers with 4 sepals and no petals; female flowers with no sepals or petals but enclosed in a pair of united bracts with 2 horns, covered with silky, white hairs

Alternate, linear leaves 1-5 cm long; mostly stalkless leaves with margins rolled inwards; covered with white or red silky, star-like hairs

Deep taproot

Woody and branching at base with old bark gray-brown; stiff, erect annual branches covered with woolly, star-like white or red hairs



A.C. Budd



J.R. Janish

Ovate, 4-angled, beaked seeds 3 mm long enclosed by silky, white-hairy bracts 4-6 mm long with 2 horn-like tips

SHRUBS

# SEEDLING PHOTOS



**Tall Wheatgrass**  
*Agropyron elongatum*

J. Thornton  
Manitoba Agriculture, Food,  
and Rural Initiative (MAFRI)



**Intermediate Wheatgrass**  
*Agropyron intermedium*

J. Thornton  
(MAFRI)



**Crested Wheatgrass**  
*Agropyron cristatum*

A. Foster,  
Saskatchewan Agriculture & Food  
(SAF)



**Slender Wheatgrass**  
*Agropyron trachycaulum*

A. Foster,  
(SAF)



**Northern Wheatgrass**  
*Agropyron dasystachyum*

A. Iwaasa, Agriculture & Agri-Food  
Canada - Semiarid Prairie Agricultural  
Research Centre (AAFC-SPARC)



**Western Wheatgrass / Bluejoint**  
*Agropyron smithii*

A. Foster,  
(SAF)



**Awned / Bearded Wheatgrass**

*Agropyron subsecundum*

M. Herbut,  
Alberta Research Council (ARC)



**Streambank Wheatgrass**

*Agropyron riparium*

J. Thornton  
Manitoba Agriculture, Food,  
and Rural Initiative (MAFRI)

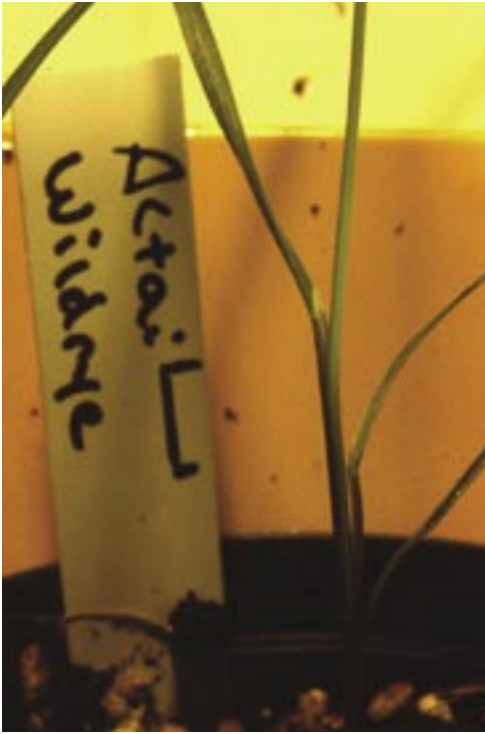


**Russian Wildrye**

*Elymus juncea*

A. Foster,  
Saskatchewan Agriculture & Food (SAF)





**Altai Wildrye**  
*Elymus angustus*

M. Schellenberg,  
Agriculture & Agri-Food Canada -  
Semiarid Prairie Agricultural Research Centre  
(AAFC-SPARC)



**Smooth Brome**  
*Bromus inermis*

A. Foster,  
(SAF)



**Meadow Brome**  
*Bromus biebersteinii*

A. Foster,  
(SAF)



**Timothy**  
*Phelum pratense*

B. Wolfgang Hoffman,  
University of Wisconsin-Extension



**Orchard Grass**  
*Daetylis glomerata*

B. Wolfgang Hoffman,  
University of Wisconsin-Extension



**Kentucky Bluegrass**  
*Poa pratensis*

B. Wolfgang Hoffman,  
University of Wisconsin-Extension



**Tall Fescue**  
*Festuca arundinacea*

B. Wolfgang Hoffman,  
University of Wisconsin-Extension



**Creeping Red Fescue**  
*Festuca rubra*

J. Thornton  
Manitoba Agriculture, Food,  
and Rural Initiative (MAFRI)



**Perennial Ryegrass**  
*Lolium perenne*

B. Wolfgang Hoffman,  
University of Wisconsin-Extension



**Annual Ryegrass**  
*Lolium multiflorum*

B. Wolfgang Hoffman,  
University of Wisconsin-Extension



**Meadow Foxtail**  
*Alopecurus pratensis*

J. Thornton  
Manitoba Agriculture, Food,  
and Rural Initiative (MAFRI)



**Creeping Foxtail**  
*Alopecurus arundinaceus*

B. Wolfgang Hoffman,  
University of Wisconsin-Extension



**Reed Canary Grass**  
*Phalaris arundinacea*

B. Wolfgang Hoffman,  
University of Wisconsin-Extension



**Green Needle Grass**  
*Stipa viridula*

A. Iwaasa, Agriculture & Agri-Food  
Canada - Semiarid Prairie Agricultural  
Research Centre (AAFC-SPARC)



**Needle and Thread**  
*Stipa comata*

A. Iwaasa,  
(AAFC-SPARC)



**Blue Grama**  
*Bouteloua gracilis*

A. Iwaasa, Agriculture & Agri-Food  
Canada - Semiarid Prairie Agricultural  
Research Centre (AAFC-SPARC)



**June Grass**  
*Koeleria macrantha*

P. Novak,  
Agricore United



**Little Bluestem**  
*Andropogon scoparius*

A. Iwaasa,  
(AAFC-SPARC)



**Sand Reed Grass**  
*Calamovilfa longifolia*

M. Herbut,  
Alberta Research Council (ARC)



**Quackgrass**  
*Agropyron repens*

Alberta Agriculture,  
Food, and Rural Development (AAFRD)



**Foxtail Barley**  
*Hordeum jubatum*

AAFRD



**Green Foxtail**  
*Setaria viridis*

B. Wolfgang Hoffmann,  
University of Wisconsin-Extension



**Persian Darnel**  
*Lolium persicum*

F.A. Holm,  
University of Saskatchewan



**Downy Brome**  
*Bromus tectorum*

Alberta Agriculture,  
Food, and Rural Development (AAFRD)





**Barnyard Grass**  
*Echinochloa crus-galli*

B. Wolfgang Hoffmann,  
University of Wisconsin-Extension



**Wild Oat**  
*Avena fatua*

F.A. Holm,  
University of Saskatchewan



**Wild Oat Ligule**  
*Avena fatua*

F.A. Holm,  
University of Saskatchewan



**Downy Brome** (left),  
**Persian Darnel** (right)

F.A. Holm,  
University of Saskatchewan



**Wheat**  
*Triticum aestivum*

G. Gingera,  
University of Saskatchewan



**Barley**  
*Hordeum vulgare*

G. Gingera,  
University of Saskatchewan



**Alfalfa**  
*Medicago sativa*

Jens Gunelson,  
University of Wisconsin-Extension



**Red Clover**  
*Trifolium pratense*

Jens Gunelson,  
University of Wisconsin-Extension



**Alsike Clover**  
*Trifolium hybridum*

Jens Gunelson,  
University of Wisconsin-Extension



**Sweet Clover**  
*Melilotus officinalis*  
*Melilotus alba*

Jens Gunelson,  
University of Wisconsin-Extension



**Sainfoin**  
*Onobrychis viciifolia*

A. Iwaasa, Agriculture & Agri-Food  
Canada - Semiarid Prairie Agricultural  
Research Centre (AAFC-SPARC)



**Cicer Milkvetch**  
*Astragalus cicer*

A. Foster,  
Saskatchewan Agriculture & Food (SAF)



**Bird's-foot Trefoil**  
*Lotus corniculatus*

Jens Gunelson,  
University of Wisconsin-Extension



**Purple Prairie Clover**  
*Petalostemon purpureum*

A. Iwaasa,  
(AAFC-SPARC)



**Winterfat**  
*Eurotia lanata*

M. Schellenberg,  
AAFC-SPARC

## Glossary

**Annual:** a plant that germinates, flowers, and sets seed, in one year.

**Anther:** the pollen container of a stamen or the male reproductive organ.

**Auricles:** a pair of ear-shaped appendages or lobes, at the junction of the blade and sheath in many grasses and sedges.

**Awn:** a slender, often terminal, bristle.

**Axillary:** a flowering structure located in, or arising from an axil.

**Biennial:** a plant that completes its lifecycle in two years.

**Capsule:** a dry fruit with more than one chamber and opening at maturity.

**Culm:** the stem of a grass or a sedge.

**Floret:** a single flower of a dense flowering unit.

**Glandular:** bearing glands (a spot on an organ surface or hair tip producing a sticky or greasy substance).

**Glume:** one of the two bracts at the base of the grass spikelet.

**Inflorescence:** a mode of arrangement of flowers in a flowering unit or structure.

**Internode:** the portion of a stem between two nodes (*see node*).

**Invader:** a plant that invades a site after a disturbance, such as improper grazing.

**Keel:** the two lower, united petals of a flower in the Legume family.

**Keeled:** a sharp or distinct ridge.

**Lacerate:** ligule margins irregularly cut or torn

**Lemma:** the lower of the two bracts enclosing the single flowers (florets) in grass spikelets.

**Ligule:** the appendage on the inner side of the leaf, at the junction of the blade and sheath in many grasses and sedges; a membrane or fringe of hair.

**Node:** the place on a stem from which leaves or branches arise.

**Palea:** the upper of the two bracts enclosing the single flowers (florets) in grass spikelets.

**Palmate:** a leaf with the shape of a hand, with three or more leaflets, veins, or lobes from a common point.

**Perennial:** a plant that persists for more than two years.

**Petals:** the second, or inner set of floral leaves, usually coloured or white.

**Pinnate:** a leaf with leaflets arranged on each side of the common axis.

**Pistil:** the female reproductive parts of a flower, including the stigma at the summit, the ovary at the base, and the style connecting the two.

**Pod:** a dry fruit in the Legume family, opening to release its seeds when mature.

**Reflexed:** bent sharply backward, or downward.

**Rhizomes:** an underground, creeping, root-like stem, often producing new plants at its nodes or tip.

**Sepals:** the first, or outer set of floral leaves, usually green and leaf-like.

**Sheath:** the part of a leaf-base which encloses the stem.

**Spikelet:** a group of singular flowers in grasses and sedges (*see floret*).

**Stamen:** the male reproductive parts of a flower with the pollen-bearing anther at the summit.

**Standard:** the large, upper petal of a flower in the Legume family.

**Stigma:** the summit of the female reproductive parts, that receives the pollen.

**Stipules:** a pair of appendages at the base of a leaf or leaf stalk.

**Stolons:** a horizontal, creeping stem from the base of a plant, producing new plants at its nodes or tip.

**Style:** the structure in the female reproductive parts between the stigma and the ovary.

**Umbel:** a flower cluster where all flower stalks arise from the same point.

**Umbellet:** a secondary umbel.

**Wing:** one of the two lateral petals of a flower in the Legume family.



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## References

- Abouguendia Z. *Re-grassing Farmland: A Practical Guide to Selecting the Right Forage Species*. Regina (SK): Grazing and Pasture Technology Program; 2000 (2nd Ed). 40 p.
- Aiken SG, Darbyshire SJ. *Fescue Grasses of Canada*. Ottawa (ON): Agriculture and Agri-Food Canada; 1990. 113 p.
- Agriculture and Agri-Food Canada – Melfort Research Station. *Forage Crops in the Aspen Parklands of Western Canada: Production*. Publ. no. 1871/E. Ottawa (ON): Agriculture and Agri-food Canada; 1991. 82 p.
- Best KF, Looman J. *Budd's Flora of the Canadian Prairie Provinces*. Ottawa (ON): Agriculture and Agri-Food Canada; 1994. 863 p.
- Booth WE, Morris HE, Payne GF, Stitt RE. *Important Grasses on Montana Ranges*. Bull. no. 500. Bozeman (MT): Montana State College Agricultural Experiment Station. 58 p.
- Brown RL, Hafenrichter AL, Mullen LA. *Grasses and Legumes for Soil Conservation in the Pacific Northwest*. Publ. No.678. Washington (DC): U.S. Department of Agriculture; 1949. 56 p.
- Bubar CJ, Hall LM, McColl SJ. *Weeds of the Prairies*. Edmonton (AB): Alberta Agriculture, Food and Rural Development; 2000. 266 p.
- Casler M, Cosgrove D, Martin N, Undersander D. *Identifying Pasture Grasses*. Publ. No. A3637. Madison (WI): University of Wisconsin-Extension, Cooperative Extension; 1996. 58 p.
- Cosgrove D, Undersander D. *Identifying Pasture Legumes*. Publ. No. A3787. Madison (WI): University of Wisconsin-Extension, Cooperative Extension; 2003. 46 p.
- Campbell JA, Clarke SE, Shevkenek W. *The Identification of Certain Native and Naturalized Grasses by their Vegetative Characters*. Publ. no. 762. Tech. Bull. no. 50. Ottawa (ON): Agriculture and Agri-Food Canada; 1950. 129 p.
- Cronquist A, Hitchcock CL. *Flora of the Pacific Northwest*. Seattle (WA): University of Washington Press; 1976. 730 p.

- Ducks Unlimited Canada, Agriculture and Agri-Food Canada – Prairie Farm Rehabilitation Administration, Saskatchewan Department of Agriculture and Food, Grazing and Pasture Technology Program. *Managing Saskatchewan Rangeland*. Revised ed. 99 p.
- Frankton C, Mulligan GA. *Weeds of Canada*. Ottawa (ON): Agriculture and Agri-Food Canada; 1970. 217 p.
- Hafenrichter AL, Harris HL, MacLauchlan RS, Miller HW, Schwendiman JL. *Grasses and Legumes for Soil Conservation in the Pacific Northwest and Great Basin States*. Ag. Handbook 339. Washington (DC): U.S. Department of Agriculture; 1968. 69 p.
- Harper AM, Horricks JS, Penney D, Smoliak S. *Alberta Forage Manual*. Edmonton (AB): Alberta Agriculture, Food, and Rural Development; 1981 (4th Ed). 86 p.
- Hermann FJ. *A Botanical Synopsis of the Cultivated Clovers (Trifolium)*. Ag. Mono. No. 22. Washington (DC): U.S. Department of Agriculture; 1953. 45 p.
- Hitchcock AS. *Manual of the Grasses of the United States*. (2nd Ed) Revised by Chase A. Don Mills (ON): General Publishing Co. Ltd.; 1971. 1051 p. 2 vol.
- Jowsey JR, McLean JS, Switzer FA, Vance FR. *Wildflowers Across the Prairies*. Vancouver (BC): Greystone Books; 1999 (3rd Ed). 382 p.
- Lawrence D, Stone C. *Northern Range Plants*. Edmonton (AB): Alberta Agriculture, Food and Rural Development; 2000. 206 p.
- Lawrence D, Stone C. *Peace Country Range Plants*. Edmonton (AB): Alberta Agriculture, Food and Rural Development; 1997. 70 p.
- Looman J. *111 Range and Forage Plants of the Canadian Prairies*. Publ. 1751. Ottawa (ON): Agriculture and Agri-Food Canada; 1983. 255 p.
- Looman J. *Prairie Grasses Identified and Described by Vegetative Characters*. Publ. 1413. Ottawa (ON): Agriculture and Agri-Food Canada; 1982. 244 p.
- Montgomery FH. *Weeds of Canada and the Northern United States*. Toronto (ON): The Ryerson Press; 1964. 226 p.
- Moss EH. *Flora of Alberta*. (2nd Ed) Revised by Packer JG. Toronto (ON): University of Toronto Press; 2000. 687 p.

Pahl MD, Smreciu A. *Growing Native Plants of Western Canada: Common Grasses and Wildflowers*. Edmonton (AB): Alberta Agriculture, Food and Rural Development and Alberta Research Council; 1999. 118 p.

Saskatchewan Agriculture and Food – Plant Industry Branch, Crop Protection Section. *Weed Control Notes: Weed Identification Series*. Regina (SK): Saskatchewan Agriculture and Food; 1984. 51 p.

Saskatchewan Agriculture and Food. *Weed Seedling Identification*. Regina (SK): Saskatchewan Agriculture and Food; 2003. 25 p.

Tannas K. *Common Plants of the Western Rangelands*. Lethbridge (AB): Curriculum and Instructional Development Services, Lethbridge Community College. 622 p. 2 vol.

Vaillancourt G. *Weed Seedling Guide: Early Identification of Grass and Broad-Leaved Weeds*. Edmonton (AB): Alberta Agriculture, Food, and Rural Development; 1996. 62 p.

## World Wide Web

Animal and Range Sciences Extension Service. Bozeman (MT): Montana State University; 2006. <http://www.animalrangeextension.montana.edu/> November 24, 2006

Arable Seed Identification System. Dundee (Scotland): Scottish Crop Research Institute; 2006. <http://www.scri.sari.ac.uk/asis/> December 20, 2006

Barkworth ME, et. al. *Grass Manual on the Web*. Logan (Utah): Utah State University; 2006. <http://herbarium.usu.edu/webmanual/> December 15, 2006

Bennet M, Evans A, McDonald M, Sites A. *Seed ID Workshop*. Columbus (OH): Department of Horticulture & Crop Sciences - Ohio State University; 2007. <http://www.oardc.ohio-state.edu/seedid/> January 8, 2007

Berdahl J, Sedivec KK, Tober DA. *Grass Varieties for North Dakota*. Fargo (ND): North Dakota State University; 2001. <http://www.ag.ndsu.edu/pubs/plantsci/hay/r794w.htm> November 24, 2006

Block N, Bonneau A, Champion M, Cory J, Harrison S, Horvath J, Pollock T, Silzer T, Sykes C. *Rangeland Ecosystems and Plants*. Saskatoon (SK): University of Saskatchewan; 2000. <http://www.usask.ca/agriculture/plantsci/classes/range/index.html> August 29, 2006

- Clark EA. Pasture Legumes Identified. Agdex No. 130. Guelph (ON): Ontario Ministry of Agriculture, Food and Rural Affairs; 2004. <http://www.omafra.gov.on.ca/english/crops/facts/04-057.htm>  
December 15, 2006
- Clayton WD, Harman KT, Williamson H. World Grass Species: Descriptions, Identification, and Information Retrieval. Kew (United Kingdom): Royal Botanic Gardens; 2006. <http://www.kew.org/data/grasses-db.html> August 31, 2006
- Cranston R, Ralph D, Wikeem B. Field Guide to Noxious and Other Selected Weeds of British Columbia. Victoria (BC): British Columbia Ministry of Agriculture and Lands; 2002. <http://www.agf.gov.bc.ca/>  
December 20, 2006
- Hebda R, Stewart H. Grasses of the Columbia basin of British Columbia. Victoria (BC): The Royal BC Museum; 2006. [http://www.livinglandscapes.bc.ca/cbasin/cb\\_grasses/index\\_grasses.html](http://www.livinglandscapes.bc.ca/cbasin/cb_grasses/index_grasses.html)  
August 29, 2006
- Fire Effects Information: Plant Species Life Form. Washington (DC): U.S. Department of Agriculture, Forest Service; 2006. <http://www.fs.fed.us/database/feis/plants/index.html> September 3, 2006
- Fitch WH. Illustrations of the British Flora (1924). [www.zum.de/stueber/fitch](http://www.zum.de/stueber/fitch) March 21, 2007
- Grassland Species Profiles. Rome (Italy): Food and Agriculture Organization of the United Nations; 2006. <http://www.fao.org/ag/aGp/agpc/doc/Gbase/Default.htm> August 31, 2006
- Growing Opportunities. Winnipeg (MB): Manitoba Agriculture, Food, and Rural Initiatives; 2006. <http://www.gov.mb.ca/agriculture/index.shtml> December 20, 2006
- Johnson K, Schmierer, J. Purdue Forage Information. West Lafayette (IN): Purdue University; 2003. <http://www.agry.purdue.edu/ext/forages/index.html>  
December 15, 2006
- Judziewicz EJ. Robert W Freckmann Herbarium. Steven's Point (WI): University of Wisconsin - Steven's Point; 2007. <http://wisplants.uwsp.edu/index.html>  
March 21, 2007
- Klinkenberg B. E-Flora of B.C.: Electronic Atlas of the Plants of British Columbia. Vancouver (B.C.): Lab of Advanced Spatial Analysis, Department of Geography, University of British Columbia; 2006. [www.eflora.bc.ca](http://www.eflora.bc.ca) March 15, 2007

- Larson, GE. Aquatic and Wetland Vascular Plants of the Northern Great Plains. Gen. Tech. Rep. R-238. Fort Collins (CO): U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. Jamestown (ND): Northern Prairie Wildlife Research Center; 1993. <http://www.npwrc.usgs.gov/resource/plants/vascplnt/index.htm> (Version 02FEB99). September 3, 2006
- Ontario Weeds – Weed Gallery. Guelph (ON): Ontario Ministry of Agriculture, Food and Rural Affairs; 2004. <http://www.omafra.gov.on.ca/english/crops/facts/ontweeds/weedgal.htm> December 15, 2006
- Pratt M, Bowns J, Banner R, Rasmussen A. Range Plants of Utah. Salt Lake City (UT): Utah State University; 2004. <http://extension.usu.edu/rangeplants/grass.htm> April 20, 2005
- Ropin' the Web. Edmonton (AB): Alberta Agriculture, Food and Rural Development; 2006. <http://www.agric.gov.ab.ca/> December 20, 2006
- Saskatchewan Agriculture and Food. Regina (SK): Saskatchewan Agriculture and Food; 2006. <http://www.agr.gov.sk.ca/> December 20, 2006
- Seed program specific work instructions. Ottawa (ON): Plant Production Division - Canadian Food Inspection Agency; 2005. [www.inspection.gc.ca/english/plaveg/seesem/man/swi-pule.pdf](http://www.inspection.gc.ca/english/plaveg/seesem/man/swi-pule.pdf) December 15, 2006
- USDA, NRCS. The PLANTS Database. Baton Rouge (LA): National Plant Data Center; 2006. <http://plants.usda.gov> December 15, 2006

## Illustrations

The illustration of streambank wheatgrass produced by Elaine L. Muth of Saskatoon, Saskatchewan.

The illustrations of tall wheatgrass seed, intermediate wheatgrass seed, crested wheatgrass seed, slender wheatgrass seed, northern wheatgrass seed and spike, streambank wheatgrass seeds, spike and ligule, russian wildrye seed, smooth brome seeds, timothy seeds, orchard grass seeds and ligule, tall fescue, creeping foxtail, reed canary grass seeds, cicer milkvetch, and bird's-foot trefoil used with permission from *Grasses and Legumes for Soil Conservation in the Pacific Northwest and Great Basin States*, No. 339, Natural Resources Conservation Service, 1968.

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# NOTES



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