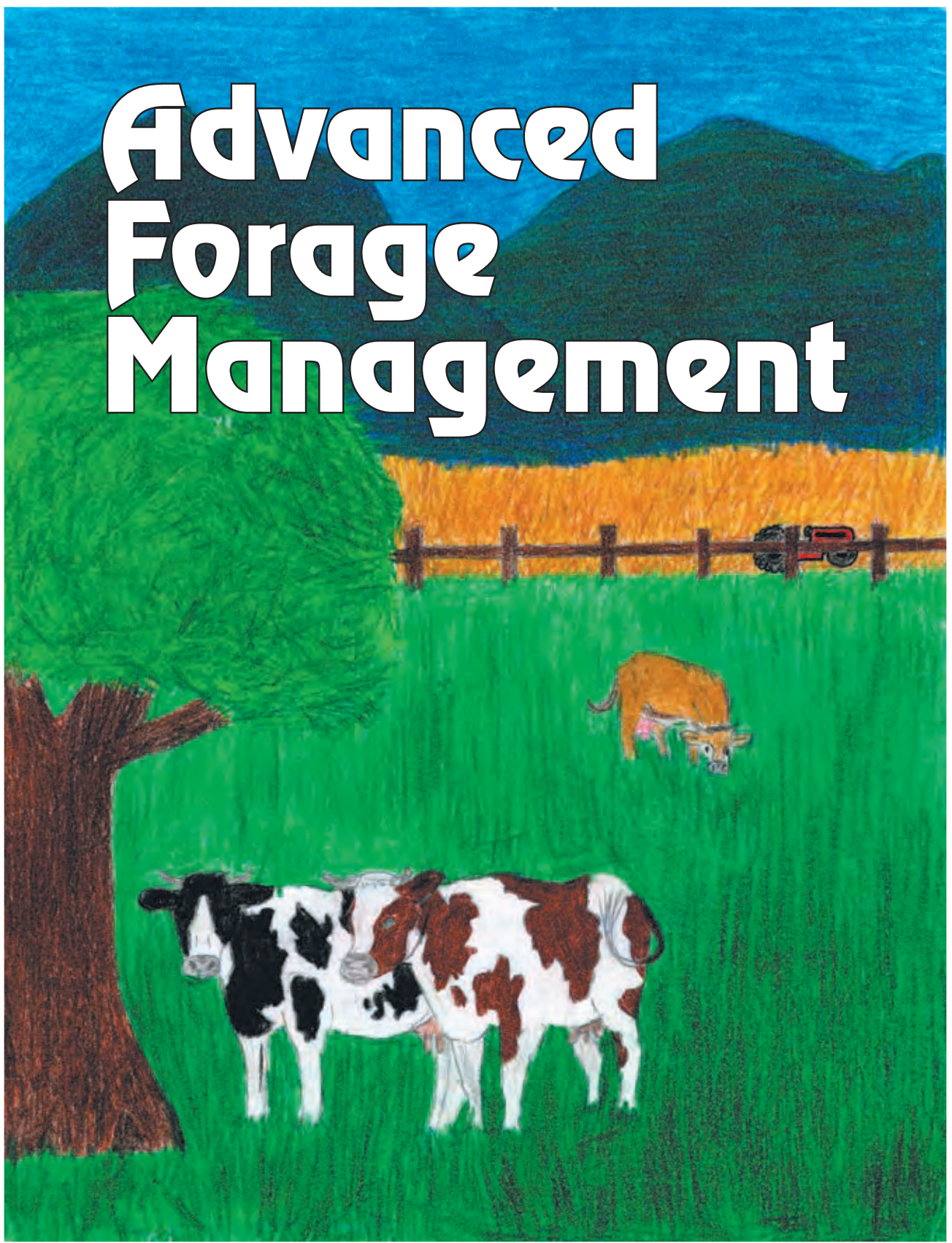


# Advanced Forage Management



**A production guide for coastal British Columbia and the Pacific Northwest**

**S. Bittman, O. Schmidt and T. N. Cramer**

# Grasses

## Good & Bad...

### CHAPTER GUIDE

- ◆ Perennial grasses—tall
- ◆ Perennial grasses—short
- ◆ Weedy grasses—perennial
- ◆ Weed grasses—annual
- ◆ How to tell the clovers apart



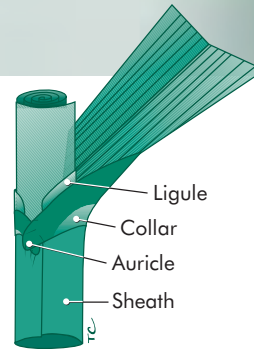
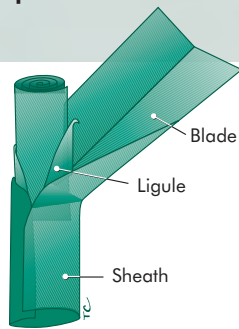
### TIPS FOR I.D.



### FORAGE FACTS



### DOWNSIDES



## Perennial grasses—tall

(more than 1m or 3 ft)

### Orchardgrass



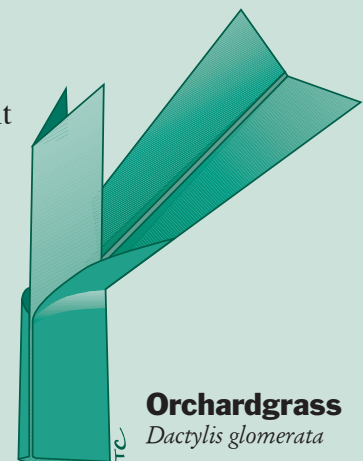
- Orchardgrass can be distinguished by its very compressed (flat) leaf sheaths (like barnyardgrass—see below) but with a short to medium-length ligule.
- Colour varies from gray to lime green according to variety.



- True bunchgrass, does not spread.
- Very high yield, excellent all-around grass.
- Withstands harvesting or grazing at all growth stages because it conserves food reserves during stem elongation.
- Varieties range in maturity by up to 3 weeks.
- Competitive with weeds and clover, especially the early maturing varieties.
- Good summer growth, even without irrigation.



- Does not tolerate flooding for long periods.
- Susceptible to stripe rust and virus; stands rarely last more than 3-4 years.



**Orchardgrass**  
*Dactylis glomerata*

## Tall fescue



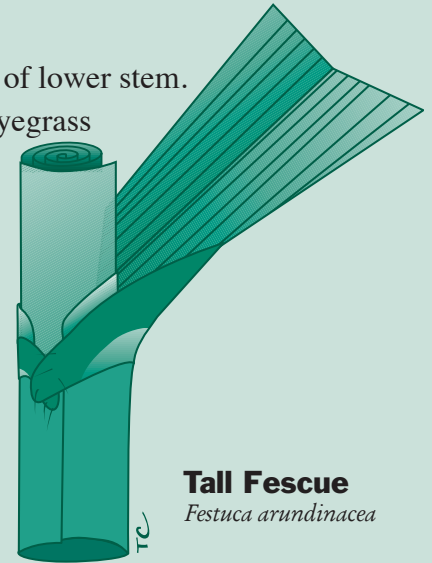
- Tall fescue can be identified by its stubby auricles and these auricles generally have short hairs (in contrast to meadow fescue).
- Leaves are shiny and smooth on bottom surface and grooved on top, moderately wide (over 5 mm or 3/16 in). Leaves feel rough, particularly on leaf edges, but some new varieties have softer leaves.
- Can be confused with meadow fescue (which has no hair on auricle) and Italian ryegrass (which has reddish stem bases).



- Classified as a bunchgrass but spreads due to lateral growth of lower stem.
- Closely related to ryegrass; can be hybridized with annual ryegrass producing intermediate types called 'festulolium'.
- Produces a strong sod.
- Relatively low growth habit and open canopy make it suitable for grazing and compatible with white clover (reports of strong competition from clover in some areas).
- Usually persistent, tolerates heat, drought, and alkalinity; also performs well under wet conditions. Very winterhardy.
- Dries rapidly after cutting.
- Grows late in fall.



- Seedlings grow sluggishly so establishment is challenging.
- May have lower palatability than orchardgrass.



**Tall Fescue**  
*Festuca arundinacea*

## Meadow fescue



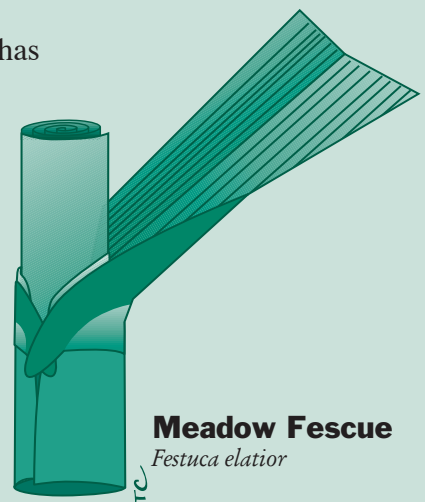
- Meadow fescue resembles tall fescue but meadow fescue has narrower leaves and no short hair on auricle; also ligule is very short.
- Meadow fescue also resembles Italian ryegrass; meadow fescue has a shorter ligule, and rough edges on leaf blades.



- Bunchgrass.
- Not widely grown in region but more winter hardy than tall fescue.
- Hybridized with ryegrass to produce 'festulolium' varieties.



- Poor productivity in this region.



**Meadow Fescue**  
*Festuca elatior*



## Timothy



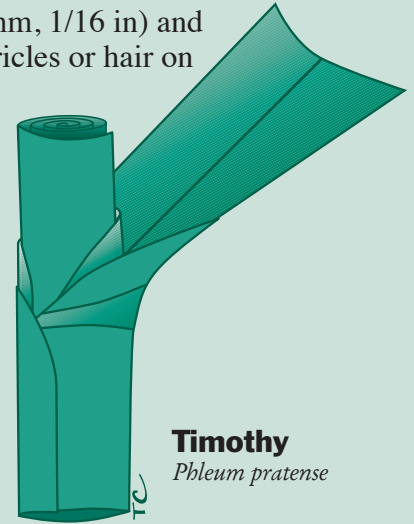
- Timothy can be distinguished from other cultivated grasses by the swelling at the base of the stem, just below soil surface (feel by pushing finger about 1 cm or 1/2 in into soil); the swelling is a fleshy storage organ called 'haplicorm'.
- Other identifying features are its rather long (more than 2-3 mm, 1/16 in) and pointed ligule, usually with a notch on either side; also no auricles or hair on collar.



- True bunchgrass.
- Very persistent, winter hardy, and high yielding.
- Can be used to produce forage for horse industry but otherwise does not excel primary grasses.
- Later maturing than other grasses.
- Tolerates some flooding.



- Very small seed must be seeded very shallow, but seedlings are reasonably vigorous.
- Weakened by harvesting or grazing during stem elongation, like brome grasses.



**Timothy**  
*Phleum pratense*

## Italian ryegrass



- Italian ryegrass can be identified by its broad leaves, with shiny bottoms and rough upper surfaces, similar to tall fescue. It can be distinguished from tall and meadow fescue by its reddish stem bases and smooth leaf edges, rather longer ligule and narrower auricles.
- Italian ryegrass can be distinguished from perennial ryegrass by its wider leaves which are rolled, not folded, when they emerge.



- True bunchgrass.
- Longevity ranges from true annuals (Westerwold varieties) to short-lived perennials that live 3 or more years.
- Most rapid establishment of forage grasses and seed can emerge from more than 3 cm (1.2 in) depth in good soils.
- Highest nutritional quality and palatability except for perennial ryegrass.
- Conditioning of stock to ryegrasses may be desirable because of high alkaloid levels.
- Moderate flooding tolerance.
- Can be inter-cropped with corn.



- Marginal winter hardiness.



**Italian Ryegrass**  
*Lolium multiflorum*

## Reed canarygrass



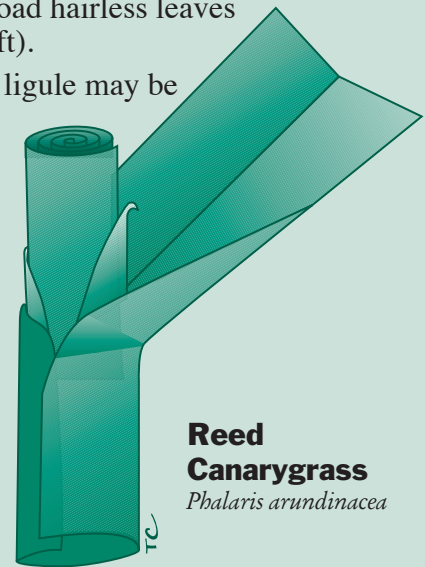
- Reed canarygrass can be distinguished by its extremely broad hairless leaves (10-18 mm, 3/8 to 11/16 in) and its great height (2 m or 7 ft).
- Ligules relatively short compared to size of leaf and tip of ligule may be turned back.



- Spreads by creeping rhizomes.
- Tolerates flooding better than any other cultivated grass.



- Small, oily, usually expensive seeds that have a short shelf-life.
- Has not persisted well in trials at PARC (Agassiz).
- Coarse grass considered to be unpalatable for pasture due to alkaloids. New varieties have reduced alkaloid levels.
- Seedlings are very sluggish hence difficult to establish.



**Reed  
Canarygrass**  
*Phalaris arundinacea*

## Bromegrasses (smooth, meadow, sweet, prairiegrass)



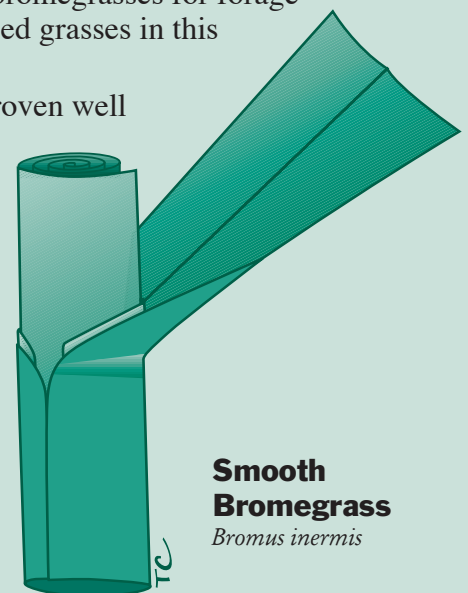
- The bromegrasses can be distinguished from other cultivated grasses because their sheath collars, where leaves are attached, are closed (like a 'V-neck' pullover) unlike other grasses where sheath is split and often overlapping all the way down (like a cardigan).
- Growth habit ranges from aggressively creeping (smooth bromegrass) to slowly creeping (meadow bromegrass) to true bunchgrasses (Pacific, prairiegrass, sweet and the weedy downy bromegrass).



- **Smooth bromegrass** has perhaps most aggressive rhizomes of cultivated cool-season grasses.
- **Meadow bromegrass** is probably the best suited of the bromegrasses for forage production, but is somewhat inferior to the commonly used grasses in this region.
- **Smooth bromegrass** and **sweet bromegrass** have not proven well adapted for forage production in the region.
- **Prairiegrass** is reputed to have excellent nutritional quality but few detailed tests have been done locally; prairiegrass has very low winter dormancy and very early spring growth; it is potentially high yielding but is generally insufficiently hardy or persistent; very large seed but has only moderate vigour.



- Most bromegrasses are weakened by defoliation during the period of stem elongation because root reserves are low, hence bromegrasses are generally not well suited to grazing; meadow bromegrass is an exception.



**Smooth  
Bromegrass**  
*Bromus inermis*

# Perennial grasses—short (less than 1m or 3 ft)

## Perennial ryegrass



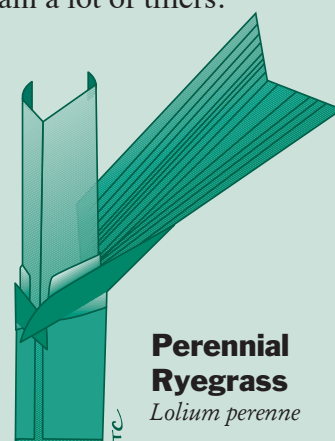
- Perennial ryegrass can be recognized by its narrow leaves (2-6 mm, 1/16 to 1/4 in) with distinctly grooved upper surface and very glossy and smooth lower surfaces.
- Perennial ryegrass can be distinguished from annual ryegrass because its leaves emerge folded, not rolled, from the sheath.
- Perennial ryegrass sometimes resembles Kentucky bluegrass but ryegrass leaves have grooved upper surface and do not have prow-shaped leaf tips.
- Note that seed heads of perennial ryegrass are slender spikes that resemble quackgrass except that seed clusters (florets) are attached edgewise instead of flat along the stem.



- Bunchgrass.
- Shortest of major cultivated grasses; productive stands must contain a lot of tillers.
- The most palatable and digestible forage grass available.
- High content of soluble carbohydrates helps it ensile.
- Varieties have wide range of maturity (up to 4 weeks).
- Well adapted to heavy soils that are wet in spring.
- Excellent for grazing, need to encourage abundant tillers.
- Performs best near the coast because it does not like summer heat or drought and is moderately susceptible to cold.



- Slow to wilt and dry.
- Stands usually last only 3 years.
- Poor drought resistance and marginal winter hardiness.



**Perennial Ryegrass**  
*Lolium perenne*

## Kentucky bluegrass



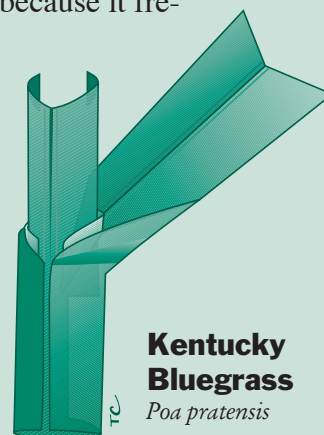
- Kentucky bluegrass can be identified by these features: leaf tip that looks like a boat prow when held sideways; translucent lines that can often be seen along the mid-rib when leaf is illuminated from behind; emerging leaves that are folded, not rolled; both leaf surfaces are smooth.



- Spreads by rhizomes.
- Although rarely seeded as a forage, it is an important pasture grass because it frequently volunteers.
- Persists in pastures because it is extremely winter hardy and grazing tolerant.
- 'Apomictic' reproduction, which means it produces seeds asexually, hence is actually clone of mother plant.
- Very wide geographic distribution.
- Resembles other bluegrass species such as Canada bluegrass and fowl meadowgrass.



- Because it is so persistent, bluegrass gradually pushes out more productive forage species in pastures and hayfields.



**Kentucky Bluegrass**  
*Poa pratensis*

## Fine fescues

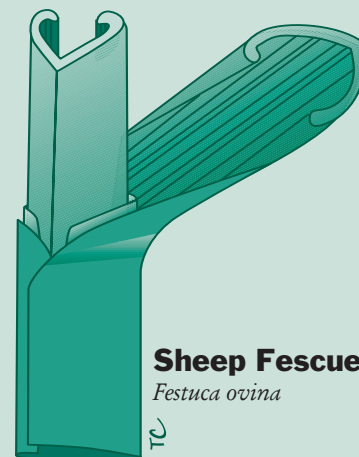


- The fine fescues have very narrow leaves which fold when dry, with deep ridges on upper surface.
- Very tolerant of grazing and cold.

## Sheep fescue/ hard fescue



- Bunchgrasses
- These grasses are suitable for use as ground cover between rows for nursery and berry crops.

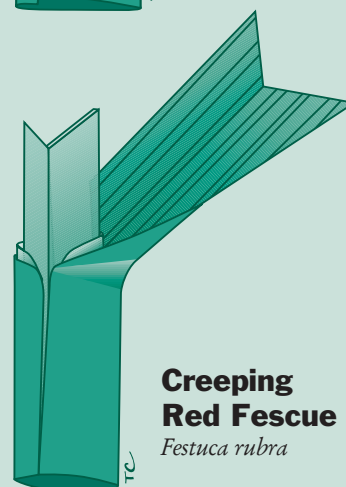


**Sheep Fescue**  
*Festuca ovina*

## Creeping red fescue



- Sod-former.
- Ligule is very short (longer on sides than back) and leaves are very narrow with ridged upper surface.
- Encroaches on dry pastures if seed source is present.
- Used in lawns because it survives and retains colour even under prolonged dry conditions.



**Creeping Red Fescue**  
*Festuca rubra*

## Bentgrasses



- Bentgrasses are most easily identified by their inflorescence. Unlike most cultivated grasses, each seed on the panicle is solitary, not in a group of 2 or more. Leaves are flat and sheaths are rolled.

### Brown top



- Very short ligule.



- Invader in poor pastures, indicator of poor production.

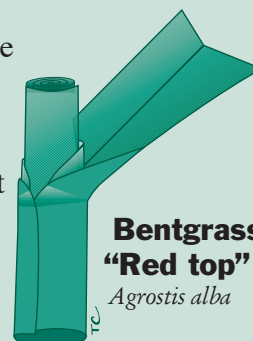


**Colonial Bentgrass "Brown top"**  
*Agrostis tenuis*

### Red top



- Very long ligule (up to 6 mm or 1/4 in).
- Grows in moist areas and has high yield potential but may be relatively unpalatable.

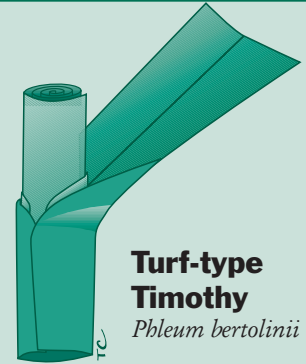


**Bentgrass "Red top"**  
*Agrostis alba*

## Turf-type timothy



- Very slow growing and winter hardy hence makes an excellent ground cover. Soft leaves are easy to mow.



**Turf-type Timothy**  
*Phleum bertolinii*

## Weedy grasses – perennial

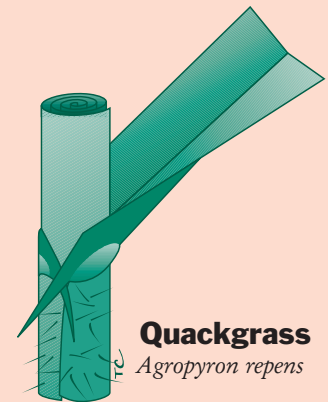
### Quackgrass or couch grass



- Quackgrass can be identified by long (2 mm or 1/16 in) thin auricles, short ligule, usually hairy stem bases, and very distinct rhizomes.



- Probably most important grassy weed in Canada.



**Quackgrass**  
*Agropyron repens*

### Velvetgrass or Yorkshire fog



- Velvetgrass is easily recognized by velvety hair all over sheath and leaf.
- Stems and leaves are very pale green.



- Spreads by above-ground prostrate stems called stolons.
- Common weed in old forage fields.
- Related species (*Holcus mollis*) has rhizomes.



**Velvetgrass**  
*Holcus lanatus*

### Pacific brome grass



- Pacific brome grass has a v-collar like other brome grasses but its leaves and sheaths are usually very hairy and its ligules are very long with hair on back.
- Native perennial bunchgrass.

*Bromus pacificus*



## Meadow foxtail



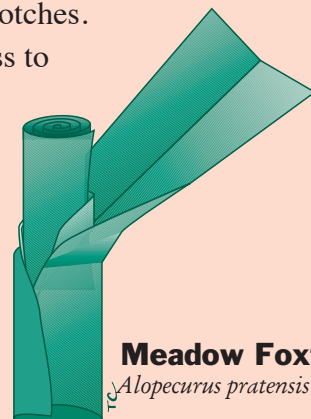
- Meadow foxtail resembles timothy superficially, because of a similar spike-like seed head. Unlike timothy, meadow foxtail heads emerge very early in spring (late April); also, its seeds are very soft and fluffy, and it has a shorter ligule without notches.
- Meadow foxtail is very noticeable in spring because it is first grass to head out, otherwise goes unnoticed.



- Bunchgrass.
- Occasionally used as a forage in northern Alberta because of early growth, grazing tolerance and flooding tolerance.



- Can become a weed because of early seed formation.
- Sown in pasture in northern Alberta but nutritional quality has been called into question in northern BC trials.



**Meadow Foxtail**  
*Alopecurus pratensis*

## Weedy grasses – annual

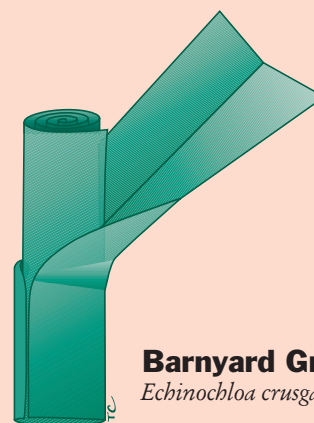
### Barnyard grass



- Barnyard grass can be easily identified even when very small by its very flat (or compressed) and hairless sheath, very smooth (hairless) leaves, and absolutely no ligule.



- Barnyard grass is a bunchgrass that can grow 2 m (6 ft) tall amongst tall crops like corn or be short and prostrate when mowed, in both cases producing persistent seed.
- Summer annual weed that germinates in warm soils in May-Aug.
- Grows very rapidly in hot weather.
- Major weed in corn and can be a problem in newly seeded grass stands.



**Barnyard Grass**  
*Echinochloa crusgalli*

### Crabgrass



- Crabgrass leaves have several stiff hairs (over 1 mm or 1/16 in) in or near the collar region.



- This weed seems to be gaining a foothold in the region.



**Hairy Crabgrass**  
*Digitaria sanguinalis*

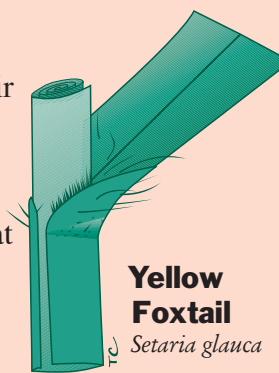
## Green and yellow foxtails



- The foxtails are most easily recognized by their ligule, which is a fringe of hair, and scattered hair on leaf sheath and upper leaf blade.
- Green foxtail has a fringe of hair on edge of sheath while yellow foxtail has long soft hair at the base of the leaf blade.

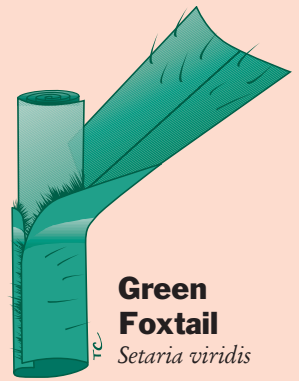


- Bunchgrasses.
- Warm season grassy weeds that germinate and grow after mid-May.



**Yellow Foxtail**

*Setaria glauca*



**Green Foxtail**

*Setaria viridis*

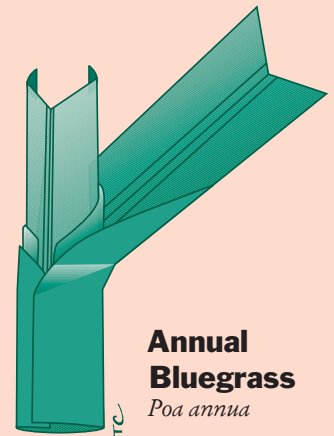
## Annual bluegrass



- Annual bluegrass has leaves with prow-shaped tips, as other bluegrasses, but the leaves are much shorter.



- Very short-lived winter or spring annual bunchgrass.
- Can seriously interfere with new seedlings.
- Does not compete with well-established forages except in high traffic areas.
- Flowers at any time of year; very prolific seed producer.



**Annual Bluegrass**

*Poa annua*

## Annual brome grasses

(cheatgrass or downy brome grass and soft chess)

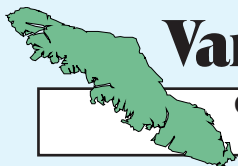


- The annual brome weeds have v-necked collars, as other brome grasses, but their leaves and stems are very hairy and their ligule is very short.



- Mostly germinate in late fall or early spring under cool moist conditions.

*Bromus tectorum*  
*Bromus mollis*



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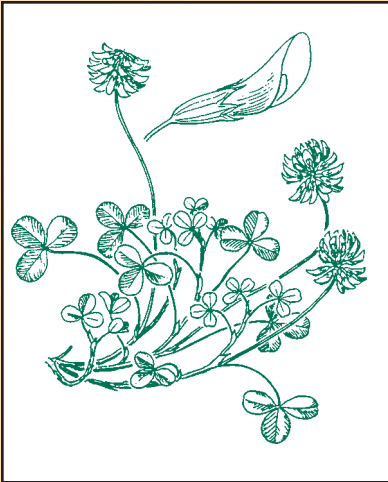
Contact: **Doug Higginson** • Ph: 1 250-246-7733 • pgr: 1-800-397-0732 • E-mail: doughigg@cvnet.net

## How to tell the clovers apart



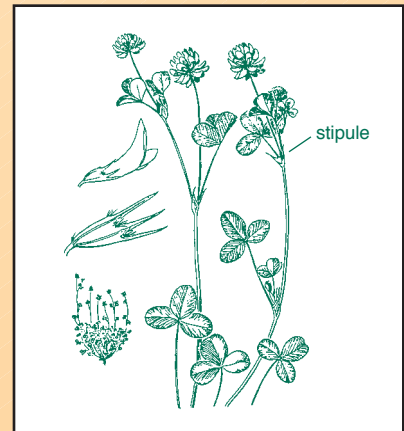
### Red clover

Pink to purple flowers.  
Leaves and stems are hairy.  
Upright growth habit.  
Leaves have a watermark.



### White clover

White to slightly pink flowers.  
Leaves and stems not hairy.  
Growth is prostrate with stem growing along the ground and rooting at nodes.  
Leaves usually have watermark.  
Leaf stipules small.  
'Ladino' clover is 3–5 times bigger than white clover but otherwise similar.



### Alsike clover

White to pink flowers.  
Leaves and stems not hairy.  
Upright growth habit.  
Leaves have very large stipule and generally no watermark.  
Veins in leaflets appear to extend beyond leaf margins.

*Drawings courtesy of Marty Chaney, USDA-NRCS*



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