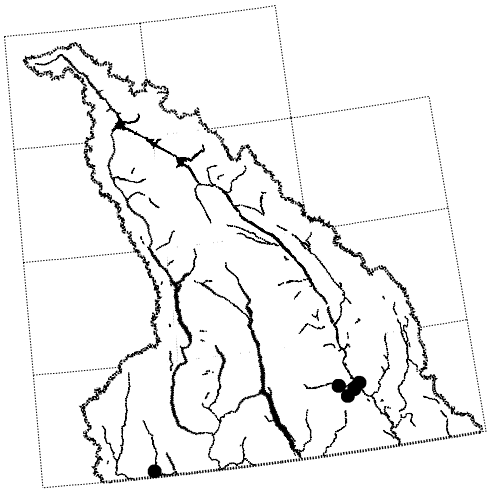
This genus is the centre of some controversy due to the re-interpretation of *Agropyron*. Several species that were originally included in *Agropyron* by Hitchcock (1951) have been placed in this genus. The species in this genus originate in the Mediterranean region, have been cultivated for forage and erosion control, and are well suited to alkaline soils. In British Columbia there are two *Thinopyrum* species—*T. ponticum* and *T. intermedium*—but only *T. ponticum* has been collected. *T. intermedium* (syn. *Agropyron intermedium*) is likely to occur in the Columbia Basin region in the future as an introduced species.

Thinopyrum ponticum (Podp.) Z.W.Liu & R.R.-C. Wang
Elymus elongatus (Host) Runemark ssp. ***ponticus*** (Podp.) Meld.
Agropyron elongatum (Host) Beauv. in part.
Tall Wheatgrass

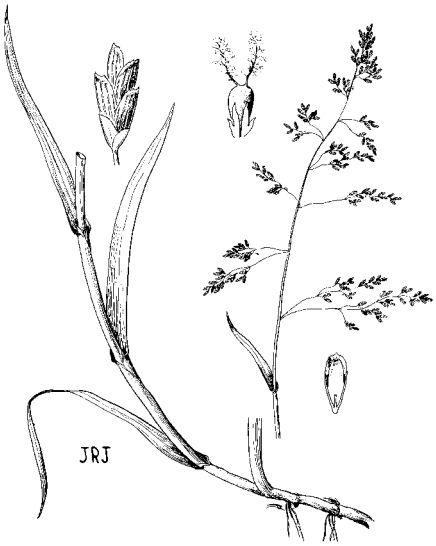
Plant: *Thinopyrum ponticum* is an introduced species that grows 50–200 cm tall. It is a tufted perennial with no rhizomes. The flowerhead is a stiff, slender spike.
Leaves and Stem: The open leaf sheath is hairy along the margins but smooth across the back of the sheath. The ligules are inconspicuous, consisting of small hairs. The stiff leaf blade is 2–6.5 mm wide, rolled inward, and thick-veined, but the margins are not thickened. The auricles are 0.2–1.5 mm long and erect rather than clasping the stem.
Flowerhead and Flowers: The slender spike is stiff and 10–42 cm long. The glume tip is blunt and the glumes are weakly keeled. The glumes are shorter than the first flower. The spikelets are slightly longer than the internodes to more than twice as long. The lemmas are prominently nerved and have blunt tips with either no awns or are minutely awn-tipped. The stem axis in the flowerhead does not break apart at maturity.
Habitat: Tall Wheatgrass is common in the southern Columbia Basin region and was introduced from southeastern Europe and western Asia for forage and soil stabilization. It grows along dry roadsides and on dry slopes in the steppe to alpine zones. In the Columbia Basin region it occurs near Cranbrook, Marysville, and Grand Forks.
Similiar species: The spikelets of Tall Wheatgrass and of Intermediate Wheatgrass both have a blunt, club-like appearance due to the lack of awns, but they differ most notably in their leaf blade edges. Intermediate Wheatgrass has thickened leaf blade edges with some hairiness on the upper surface and it has a rhizome. Tall Wheatgrass has no thickened margins and the blades are rough or densely hairy. It is tufted rather than having a rhizome. This species is called *Elymus elongatus* in Douglas et al. (1994), and is similiar to *E. hispidus* in Douglas et al. (1994).

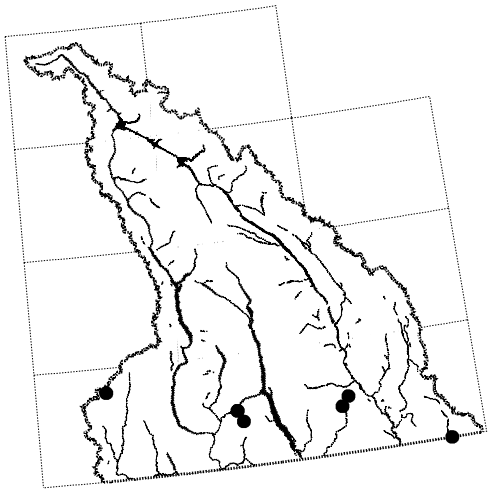


A number of species formerly contained in *Glyceria* have been moved into *Torreyochloa* and *Puccinellia.* All three genera have awnless lemmas and lemma nerves that are parallel rather than meeting at the tip. The five lemma nerves of *Puccinellia* are less obvious. The five to seven nerves of *Torreyochloa* and *Glyceria* are raised. *Torreyochloa* has open to partially open leaf sheaths in contrast to *Glyceria*, which has closed leaf sheaths. *Torreyochloa* was named after J. Torrey, an early American botanist. The two species of *Torreyochloa* in British Columbia are *T. pallida* and *T. pauciflora.*

Torreyochloa pauciflora (J.S. Presl.) Church
Weak False-manna

Plant: *Torreyochloa pauciflora* is a native species that grows 30–150 cm tall. It is a perennial that is often bent at the base, with well-developed rhizomes and a broad, open flowerhead.
Leaves and Stem: The lower part of the stem may rest on or near the surface and root at the nodes. Sheaths are open to partly closed. The leaf blades are flat and 3–15 mm wide, and feel slightly rough to the touch. There are no auricles. The ligule is 3–9 mm long and has a pointed, tattered tip.
Flowerhead and Flowers: The flowerhead is 5–20 cm long, open, and rather loose. The two to three branches per node are perpendicular to the stem axis or even drooping. Spikelets are three- to seven-flowered. Two, small, unequal glumes are much shorter than the first flower. Lemmas are 2–3 mm long, have rounded margins, and have a purple band just below the edge of the margin.
Habitat: False-manna grows in the shallow water of marshes, swamps, and wet meadows in sites such as Sage Creek in the Flathead, at Nelson, and near Cranbrook.
Similar Species: You can tell Weak False-manna from other alkaligrasses (*Puccinellia* spp.) by its long prominent ligule and wide leaf blades. Technically, it has more prominent nerves on the lemma. Weak False-manna is also known as *Puccinellia pauciflora* (Presl) Munz, and *Glyceria pauciflora* J.S. Presl in C.B. Presl.





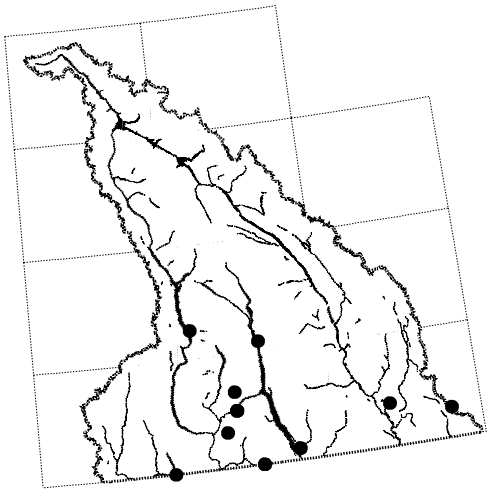
Trisetum are fairly palatable grasses, but they are not abundant as forage. In the alpine zone, *Trisetum spicatum* is an important forage for deer and goats. *Trisetum* is from the Greek words *treis*, meaning three, and *seta* meaning bristles, referring to the three awns on the type specimen for the genus.

***Trisetum*—Adapted from Douglas et al. (1994)**

1a. Lemmas awnless or with awns that rarely exceed 1 mm . . . *Trisetum wolfii*
1b. Lemmas awned; awns exceed length of lemmas 2
  2a. Flowerhead spike-like, dense; basal leaf sheaths hairy and upper glume not much longer than lower one (almost equal). . . . . *Trisetum spicatum*
  2b. Flowerhead not spike-like but open and loose; basal leaf sheaths smooth and upper glume much longer than lower one. . . . . *Trisetum cernuum*

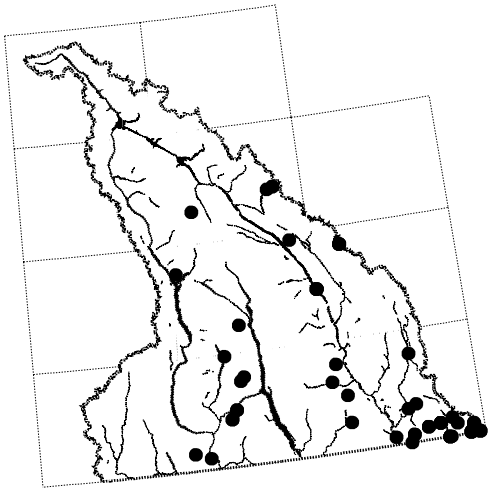
Trisetum cernuum Trin.
Nodding Trisetum

Plant: *Trisetum cernuum* is a native species 10–70 cm tall. It is a tuft- forming perennial with few-flowered, nodding flowerheads.
Leaves and Stem: Sheaths are open. The drooping, flat leaf blades are 5–12 mm wide. The leaves have thin, prominent tips. There are no auricles. The ligules are well developed and 1.5–3 mm long.
Flowerhead and Flowers: The flowerhead is widely branched and sparse, bearing a few spikelets at the end of drooping branches. The second or inside glume is much larger than the first and has a sharp tip that extends from two teeth at the top of the glume. The lemmas of the two flowers each have a 10-mm-long bent awn.
Habitat: Nodding Trisetum grows in moist woods and forests, and on streambanks. In the Columbia Basin region it occurs in several lakes around Nelson, at Nakusp, and along the Pend'Oreille River.
Similar Species: There are two varieties of Nodding Trisetum in British Columbia: *cernuum* and *canescens*. Variety *cernuum* has an open, lax or drooping flowerhead and 6- to 11-mm-wide leaves, and is most often found along the coast; whereas variety *canescens* has a narrow, interrupted flowerhead, upward-pointing branches, and 4- to 7-mm-wide leaves. Nodding Trisetum resembles Spike Trisetum (*T. spicatum*). Spike Trisetum and Nodding Trisetum each have awns, but they are differentiated by the flowerhead type and the glumes. The flowerhead of Spike Trisetum is spike-like and the upper glume is not much longer than the lower one, whereas the flowerhead of Nodding Trisetum is open to narrow and nodding but not spike-like, and the upper glume is much longer than the lower one.



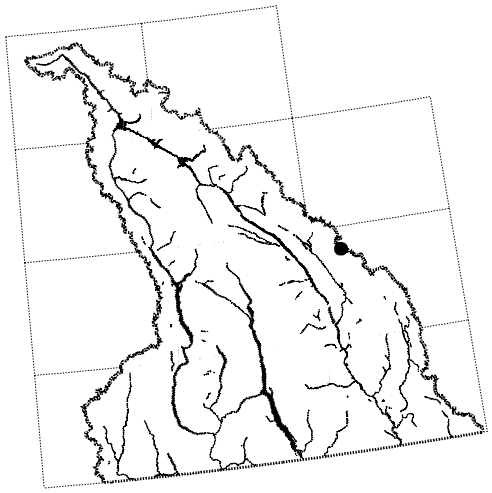
Trisetum spicatum (L.) Richt.
Spike Trisetum

Plant: *Trisetum spicatum* is a native species that grows 50–70 cm tall. It is a densely tufted perennial with an often interrupted, dense, spike-like flowerhead.
Leaves and Stem: The stem and leaves are often hairy or rough to the touch. The sheath is open and keeled at the upper end. The ligules are 0.5–2 mm high, ragged along the edge, and hairy throughout. Flat or folded leaves are 1.5–5 mm wide and finely hairy.
Flowerhead and Flowers: The narrow flowerhead is spike-like and 2–15 cm long, most often purplish, tawny, or silver coloured. The spikelets contain two to three flowers. Almost equal, membrane-like glumes are rough along the keel and surpass the first flower. Lemmas are rough to the touch and have a bent awn that is 5–6 mm long, arising 1.5 mm from between two teeth at the tip.
Habitat: Spike Trisetum grows on moist to dry sites in all zones, and often occupies rocky sites. It is common throughout the Columbia Basin region and occurs at Windermere, Flathead, Mount Assiniboine Park, Nelson, Yoho National Park, and New Denver.
Similar Species: Spike Trisetum is highly variable and some authors have recognized several subspecies, but at this time Douglas et al. (1994) recognize only the one species.



Trisetum wolfii Vasey
Wolf's Trisetum

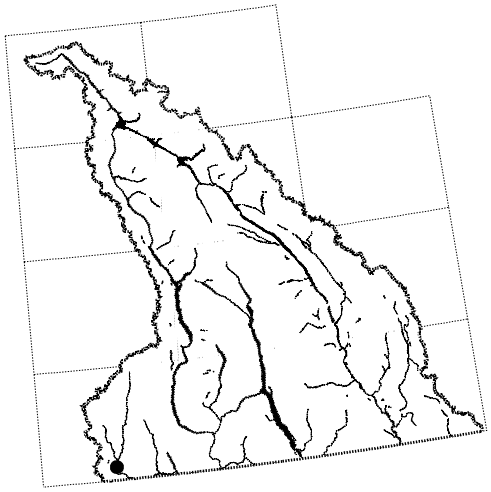
Plant: *Trisetum wolfii* is a native species that grows 40–80 cm tall. It is a perennial that occurs as a loosely tufted form or has a rhizome-bearing form. The flowerhead is a narrow spike that is purplish before complete maturity.
Leaves and Stem: The open sheaths feel rough, though they also sometimes have soft hairs. The ligules are 2.5–4 mm high and have a blunt shape and ragged hairs along the margins. Flat leaf blades are 2–6 mm wide. There are no auricles.
Flowerhead and Flowers: The narrow spike-like flowerhead has short branches that point upward. Purplish spikelets are two- to three-flowered. Glumes are equal in length to, or exceed, the first flower. The blunt lemmas are 4.5–6.5 mm long. The callus has sparse hairs on it. The stem between the flowers is also sparsely hairy. There are no awns, and this feature distinguishes this species from other *Trisetum*.
Habitat: Wolf's Trisetum grows in wet meadows and along streams in the subalpine zones. The only material collected for British Columbia is from Mount Assiniboine Park, and that specimen is held in Ottawa. This species is Red-listed by the B.C. Conservation Data Centre (Douglas et al. 1998).
Similar Species: Due to the lack of awns, Wolf's Trisetum is fairly easy to distinguish from other *Trisetum* species.



This genus is probably the most famous grass of all because it is cultivated for flour. Occasionally it is planted as a roadside cover, or it escapes from cultivation, but it rarely persists for more than a few seasons. There are estimated to be 15 species of Old World wheat, but there are numerous cultivars.

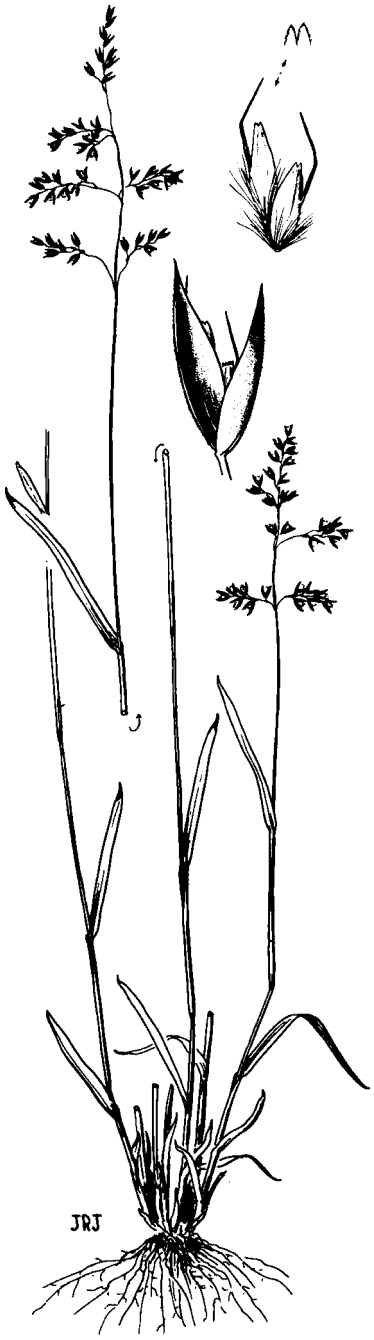
Triticum aestivum L.
Wheat

Plant: *Triticum aestivum* is an introduced species that grows to 1.5 m tall. It is an annual or winter annual, with hollow stems. The spike-like flowerhead has one 1- to 2-cm-long spikelet per node.
Leaves and Stem: The smooth, open sheaths have well-developed auricles, and the membrane-like ligules are 1 mm long. The leaves are flat and 5–20 mm wide.
Flowerhead and Flowers: The flowerhead is a spike and it is 5–12 cm long. Spikekets are two- to five-flowered, with firm, keeled glumes that may be blunt or have an awn. The broad lemmas may be keeled and have several obvious non-convergent nerves. These nerves may be a different colour of green, and give the impression of being painted on the lemma. The lemmas may be awnless to long-awned.
Habitat: Wheat occurs along roadsides and in fallow fields. In the Columbia Basin region it grows along the roadside at Grand Forks.
Similar Species: Wheat appears very distinct from any of the native grasses, but it is difficult to determine the type of wheat, because some varieties are awned and others have a beardless phase.

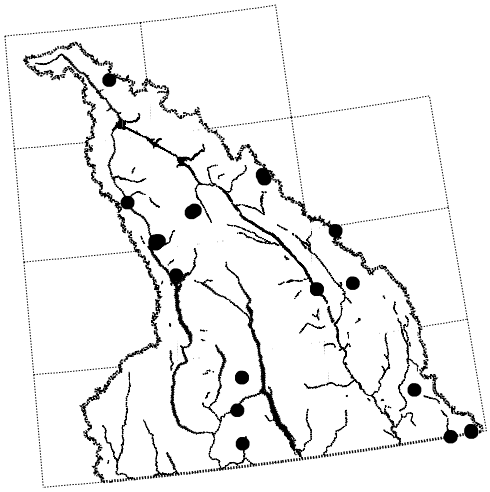


Vahlodea was originally part of *Deschampsia*, but is now separated, based on flat leaf blades, blunt ligules, and purple spikelets.

Vahlodea atropurpurea (Wahlenb.) Fries
Deschampsia atropurpurea (Wahlenb.) Scheele
Mountain Hairgrass



Plant: *Vahlodea atropurpurea* is a native species that grows 15–60 cm tall. It is a loosely tufted perennial with an open, often drooping flowerhead and purplish spikelets.
Leaves and Stem: Sheaths are open and there are no auricles. The ligules are 1.5–3.5 mm long, blunt, and hairy, with a jagged upper edge. The smooth, soft-hairy leaves are deep green, flat, and 4–6 mm wide. The leaf tips can appear prow-like as in the genus *Poa*.
Flowerhead and Flowers: The open, drooping flowerhead is 5–10 cm long. The purplish spikelets often have three flowers. Slightly unequal, purplish glumes are sharply pointed at the tip but also narrow toward the base. Both glumes exceed the second flower in length, therefore concealing it. The 2.5- to 4.0-mm-long lemmas end in a jagged point. The callus has hairs about 1/2 the length of the lemmas. A stout, 2.5-mm-long twisted awn extends from the midpoint of the second lemma.
Habitat: Mountain Hairgrass grows in moist meadows and subalpine forests and along streambanks in the montane to alpine zones. In the Columbia Basin region it is common at upper elevations and occurs at Kokanee Glacier Provincial Park, Mount Revelstoke National Park, Sproat Mountain, Yoho River Valley, Glacier National Park, and Akamina-Kishinena Creek.
Similar Species: *Vahlodea* is similar to *Deschampsia*, but it differs in that the leaves of *Vahlodea* are flat compared to inrolled, the ligule of *Vahlodea* is blunt, not pointed, and the spikelet of *Vahlodea* is purplish, compared to greenish or bronze in *Deschampsia*.



Vulpia includes the weedy annual species once included in *Festuca* (Aiken and Darbyshire 1990). The differing habit, the tendency of *Vulpia* species to set seed by self-fertilizing, and the reduced anther number (one to three, compared to three in *Festuca*), is regarded as enough to place *Vulpia* species in their own genus.

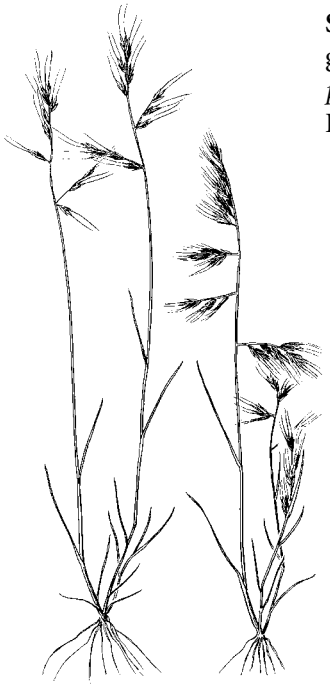
***Vulpia*—Adapted from Hickman (1993)**

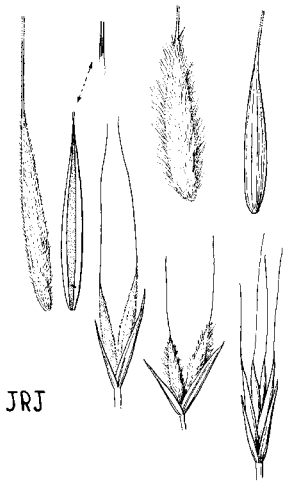
1a. Spikelets with four to eleven closely overlapping flowers; spikelet axis hidden; lemma awn less than 7 mm . . . . . *Vulpia octoflora*

1b. Spikelets with two to six loosely overlapping flowers; spikelet axis visible; lemma awn 5–13 mm . . . . . *Vulpia microstachys*

Vulpia microstachys (Nutt.) Munro var. ***pauciflora*** (Scribn. ex Beal) Lonard & Gould
Small Fescue

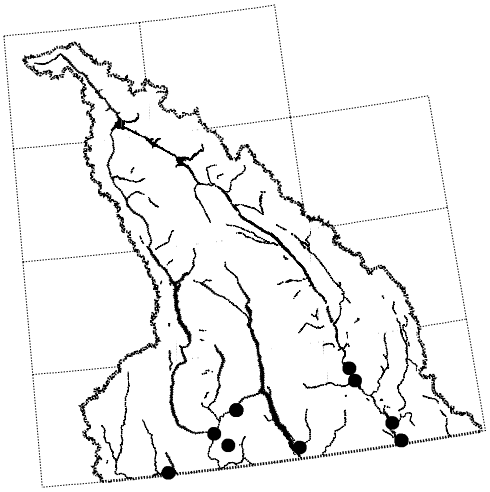
Plant: *Vulpia microstachys* is a native species that grows 5–40 cm tall. It is a weakly tufted annual with an open flowerhead and branches that appear swept to one side.
Leaves and Stem: Sheaths are open and there are no auricles The hair-like leaf blades are more or less inrolled. The ligules are 0.2–0.5 mm long, and have a rough to fringed margin.
Flowerhead and Flowers: The branches of the somewhat open flowerhead often sweep to one side. Some forms have spike-like flowerheads with more erect branches. Smooth, to slightly hairy, spikelets include two to six flowers. The glumes are unequal to nearly equal in length, and somewhat shorter than the spikelet. In our form (=*Festuca pacifica*) the narrow glumes are more or less hairless. Lemmas bear a 5- to 13-mm-long awn from the tip. Some of the flowers appear to never open, and contain undeveloped anthers.
Habitat: Small Fescue occupies dry meadows, fields, and disturbed sites such as roadsides. It has been collected from only one site (at Castlegar), but likely occurs more widely.
Similar species: Small Fescue belongs to a complex group of variable subgroups (see Hitchcock and Cronquist 1969, Part 1). Also know as *Festuca pacifica* Piper and *F. microstachys* Nutt. Included in this group is *F. reflexa* Buckl. (*Vulpia reflexa* Rydb.).





Vulpia octoflora (Walt.) Rydb.
Six-weeks Grass

Plant: *Vulpia octoflora* is a native species that grows 10–60 cm tall. It is an annual with a slender flowerhead with short branches that point upward.
Leaves and Stem: The sheaths are open and there are no auricles. Hair-like ligules reach 0.2–0.7 mm long and are higher on the sides than in the centre. The leaf blades are fine and inrolled. Stems are ridged lengthwise at the uppermost node.
Flowerhead and Flowers: The slender flowerhead is 2–20 cm long and consists of short upward-pointing branches. There are 4–11 closely placed flowers per spikelet. The unequal glumes are long and narrow and much shorter than the spikelet. Lemmas have a straight, 1- to 7-mm-long awn.
Habitat: Six-weeks Fescue is regarded as a weedy species in Hitchcock (1969). It grows on moderate to dry slopes, in open forests, and on roadsides in the steppe and montane zones. In the Columbia Basin region it occurs at Nelson, Creston, Kootenay, Tobacco Plains, Grand Forks, and Waldo (which is now under Lake Koocanusa).
Similar species: Six-weeks Fescue is part of a complex of plants that were once included in the *Festuca* genus as *Festuca octoflora.* There are three varieties of Six-weeks Fescue in British Columbia: variety *glauca*, variety *octoflora,* and variety *hirtella.* Variety *octoflora* and variety *hirtella* have larger spikelets (5.6–10 mm long) and longer awns (2.5–9 mm long). Variety *glauca* has spikelets that are only 4–5.5 mm long, and 0.3- to 3-mm-long awns.



HYBRIDS

A hybrid is the offspring of two different parents, varieties or species that differ in one or more heritable characteristics (Woodland, 1997). Most often the cross occurs between two different species, but it can occur between two different genera, species, subspecies or varieties. Grass biologists have recognized that a certain amount of hybridization occurs in nature between species that have overlapping ranges, and therefore many of the subspecies and varieties recognized are actually hybrids. How widespread is this interbreeding in natural populations? In the past few years, research has indicated that this natural hybridization is widespread and important, certainly within genera, but how important is hybridization between genera? Plant breeders artifically cross different genera due to the increased economic value in the new species. In fact, many of the commercial grass mixtures are the result of crosses conducted to breed certain characteristics into the "new" grass. For example, the forage grass *Kemal* is of hybrid origin from *Festuca pratensis* and *Lolium perenne*. In many cases, these hybrids are unable to naturalize and remain isolated to areas where they are continually planted. But in other cases, these artificially created hybrids do naturalize and interbreed with natural populations creating identification problems. So far, natural hybrids between genera have not been recognized, but several authors have recognized x *Elymordeum macounii* as a commonly occurring sterile hybrid between two well known genera, *Elymus trachycaulus* and *Hordeum jubatum*.

x *Elymordeum macounii* (Vasey) Barkw.
x *Agrohordeum macounii* (Vasey) Lepage
Elymus macounii Vasey A sterile hybrid between ***Elymus trachycaulus*** and ***Hordeum jubatum***
Macoun's Wildrye

Plant: x *Elymordeum macounii* is a native hybrid. It is a loosely tufted sterile perennial with a tall terminal spike and spikelets pressed tightly to the stem axis.
Flowerhead and Flowers: The plants are sterile hybrids and the anthers do not open, even at maturity, therefore remaining attached when they should have withered and disappeared.
Habitat: Dry, open sites in the steppe and montane zones. In the Columbia Basin region, Macoun's Wildrye occurs at Windermere. In areas where forage crops are regularly planted, a number of hybrids have been noticed but not formally recognized in Canada, despite being recognized in England. Two of these have been observed to occur in the Columbia Basin region at Rock Creek—x *Festulolium braunii* and x *Festulolium loliaceum*. It is most likely that they were planted together as a combined seed mix. In the future, it will be interesting to note whether these hybrids occur elsewhere in British Columbia, since they have naturalized in England.

x *Festulolium loliaceum* (Huds.) P. Fourn.
Festuca pratensis* x *Lolium perenne
Hybrid Fescue

Plant: x *Festulolium loliaceum* is an introduced species that grows 30–120 cm tall. It is a loosely tufted perennial with an erect, spike-like flowerhead that may vary from simple and unbranched, to multiple-branched.
Leaves and Stem: The sheath is smooth and the membrane-like ligule is up to 1 mm long. The small, spreading auricles are smooth. The flat leaf blades are hairless, 7 mm wide and can be rough along the edges.
Flowerhead and Flowers: The flowerhead is 10–30 cm long. The oblong spikelets are sterile and are on short stalks. The spikelets are located in two rows on opposite sides of the stem axis. The plant appears very two-dimensional, and as a fresh specimen looks almost as if pressed. The lemmas are awnless.
Similar Species: x *Festulolium braunii* (K. Richt) A. Camus [*Festuca pratensis* x *Lolium multiflorum*]. This hybrid differs from x *F. loliaceum* in having awned lemmas but it also has hairless auricles.