

Bromus rigidus & sterilis

R I G I D B R O M E & B A R R E N B R O M E

ENGLISH NAMES Rip-gut brome¹ or rigid brome¹ and barren brome² or poverty brome²

SCIENTIFIC NAME *Bromus rigidus*
(alt. *B. diandrus* ssp. *rigidus*)¹
and *Bromus sterilis*²

FAMILY Poaceae or Gramineae (Grass)



Photo Credit: © JAMIE FENNEMAN/E-FLORA BC

Rip-gut brome and barren brome are hairy annual winter grasses having long, droopy leaves and distinct flowerheads with long awns.

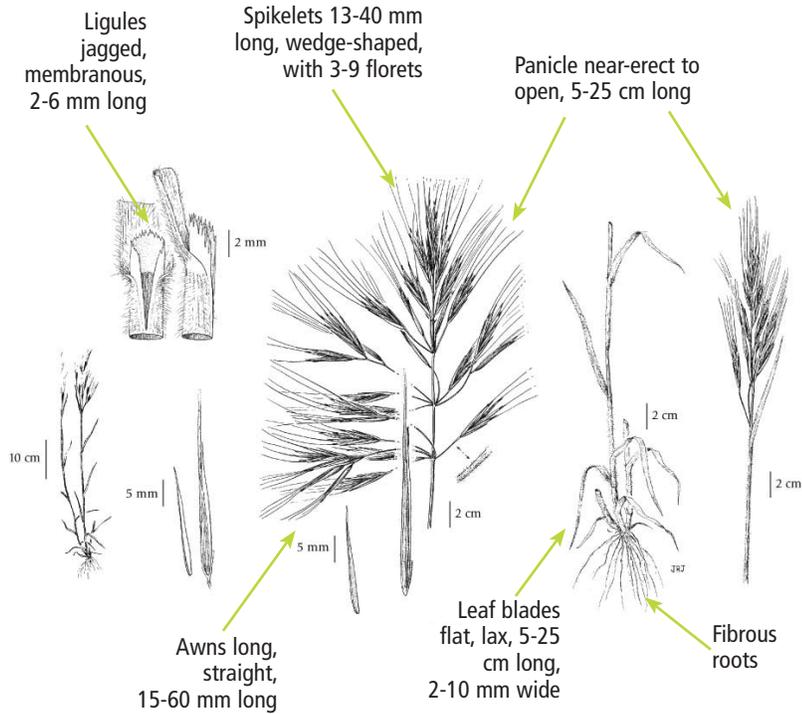
RANGE/KNOWN DISTRIBUTION

These grasses have been introduced to British Columbia from Eurasia. They commonly occur on Southern Vancouver Island and the Gulf Islands, rarely in the Vancouver area (rip-gut brome) and infrequently in the southcentral and southeastern areas of the province (barren brome). They also occur in the east of Canada. Their global range also includes North Africa, the United States, Central and South America, Australia and New Zealand.

IMPACTS ON GARRY OAK AND ASSOCIATED ECOSYSTEMS

Non-native grasses are present in most Garry oak ecosystems and may cover a combined total of 50-80 percent of the landscape. Non-native winter grasses such as rip-gut and barren brome develop early in the season, aggressively out-competing native species for light. Competition for water continues throughout the year, becoming critical during the dry summer months. As the grasses die off, they form a dense litter layer that blocks light and thus suppresses the regeneration and establishment of native species. The litter also provides fuel and creates conditions for detrimental high-intensity fires. As it decomposes, nitrogen is added to the soil, favouring the growth of the non-native species, particularly barren brome. These grasses can also be a medium for the introduction of harmful fungi, viruses and nematodes. Combined, these effects can significantly change the plant composition, reducing available habitats and food sources for some rare plant and animal species.

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Vascular Plants of the Pacific Northwest, Leo C. Hitchcock; Arthur Cronquist, and Mario Ownbey, illustrations by Jeanne R. Janish. Published by the University of Washington Press (1969).

FIELD DESCRIPTION

Rip-gut and barren brome have fibrous roots and are sometimes tufted. The stems are erect or bent near the base and up to 100 cm tall. Leaf sheaths and blades are soft-hairy. The flowerheads have drooping lower branches and one to three spikelets per branch. The slender glumes are awl-shaped to lanceolate. Lemmas have long and straight awns that emerge from between two teeth at the apices.

Rip-gut brome is considered by some experts to be a subspecies (ssp. *rigidus*) of great brome (*Bromus diandrus*), but is distinguished by the shorter and sparser hairs on its leaves, shorter spikelet branches, and elongated floret callus and scar. Expert consultation may be required as grass identification can be difficult.

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LIFE HISTORY

Rip-gut and barren brome are fast growing and spreading annuals. They produce copious amounts of seed each year, with one plant producing as many as 3,000 seeds. Most seeds germinate in the autumn in as little as 27 days after dispersal. Germination in these species is inhibited by light. These winter grasses start growing early on in the season. They mature early, flower in early spring, and complete their lifecycles before summer drought conditions set in. Flowers are self-pollinated or pollinated by the wind. Long-distance dispersal of seeds relies largely on fauna.

HABITAT

In British Columbia rip-gut and barren brome occur in dry to mesic sites having well-drained soils and southern to western aspects. They are tolerant of drought, low-nutrient soils and cold temperatures. Typical habitats are disturbed sites such as waste areas, cultivated fields, roadsides as well as meadows and rock outcrops.

MANAGEMENT

Management of non-native grasses should focus on the removal of the grasses as well as the accumulated litter layer, while minimizing soil disturbance. Carefully identify native and non-native species before starting any treatment. If the infestation is already large, priority should be given to areas having highest conservation values, such as those with rare species.

Develop a long-term, realistic program for invasive species removal before undertaking any work. Before taking action, obtain expert advice. Please refer to the introductory section of this manual.

PHYSICAL CONTROL: Manual removal by hand pulling or careful hoeing can be effective in spring or early summer before the seed sets. However, this is very labour intensive and is feasible only when patches are small. Populations of these bromes have been significantly reduced in sand dune restoration plots where non-native shrubs, litter and duff were removed, exposing the seeds to light and inhibiting their germination. Disturbance to the soil should be minimal.

BIOLOGICAL CONTROL: No known biological agents are available.

BROMUS RIGIDUS & STERILIS

CHEMICAL CONTROL: Populations too large for manual removal can be managed by cautious application of herbicides. MON 37500 was found to significantly control rip-gut brome when applied to plants at the one- to four-leaf stage; older plants were not affected. Application of the herbicide paraquat to flowering adult specimens significantly reduced rip-gut brome populations in following years. *Herbicides should only be used with extreme caution, and under expert advice, in sensitive Garry oak ecosystems.*

OTHER TECHNIQUES: For control of rip-gut and barren brome by burning, spring burns were found to be the most effective. Brome seeds are also susceptible to late summer to fall burning as they remain in the inflorescence late into the season, are concentrated in the surface litter layer, and are sensitive to heat. Prescribed burning should only be undertaken with expert advice as the effect can be highly variable depending on timing, species composition and fire intensity, among other factors. Grazing or cutting is ineffective for managing these bromes, which can withstand and even increase with frequent defoliation.

PREVENTATIVE MEASURES: Soil disturbance and the use of fertilizers should be avoided in natural areas. Encourage plant nurseries, gardeners and farmers to stock and use native or non-invasive species, and to avoid using non-native grasses such as rip-gut and barren brome. Equipment, clothing and animals should be checked and cleared for seeds when leaving an infested area.

PERSISTENCE: Neither rip-gut nor barren brome have persistent seedbanks, which survive for a maximum of 18 months.

SELECT REFERENCES

Holmes, T. H. and K. J. Rice. 1996. Patterns of growth and soil-water utilization in some exotic annuals and native perennial bunchgrasses of California. *Annals of Botany* 78: 233-243.

Levine, Alice E. 2008. Evaluating prescribed burn methods for controlling invasive *Bromus diandrus*, ripgut brome (abstract). 93rd Ecological Society of America Annual Meeting. Wilwaukee, WI.

A comprehensive annotated bibliography of literature specific to rip-gut brome and barren brome is available at www.goert.ca.

For more information contact the Garry Oak Ecosystems Recovery Team, or see the website at www.goert.ca