



# Downy brome

*Bromus tectorum* (Aka cheatgrass, cheatgrass brome, drooping brome, downy chess, early chess)



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## Overview:

Downy brome is an annual grass (Poaceae family), typically a winter annual, that reproduces by seed only. It behaves as a summer annual when early spring moisture or limiting fall moisture occurs. It is most active in the cool season and rapidly develops lateral and vertical fibrous root system to compete with perennial vegetation for moisture. Downy brome is native to the Mediterranean and southwestern Asia. It now occurs throughout most of Canada, the U.S., and northern Mexico. It was introduced to North America via ship ballast, contaminated crop seed, and packing materials (straw). It was even an ingredient of reclamation mixes at one time because of its ability to establish on dry, gravelly soils. Downy brome is very aggressive in dry grasslands, especially when accompanied by over grazing.

Plant size and morphology can vary greatly, depending on site conditions. Downy brome is capable of producing a second seed crop per season from additional tillers.<sup>1</sup> Seed production can vary from 25 to 5000 seeds per plant.<sup>2</sup>

Downy brome needs to germinate early or late season as hot, dry weather kills seedlings.<sup>1</sup> It is not a strong competitor with established perennials but established downy brome will out-compete perennial seedlings for moisture. It is commonly infected with a head smut fungus on cooler/moister aspects which can reduce stand density temporarily.<sup>1</sup>

Downy brome is strongly adapted to frequent fire regimes - it accumulates litter which dries completely by summer and is highly flammable.<sup>1</sup> Seeds can survive low-intensity burns, especially if already buried. It is a strong competitor post-fire. Fires in downy brome infestations can increase soil erosion.

It has altered the under storey plant communities of west coast Oak ecosystems it has invaded.

## Habitat:

Downy brome requires cool, semi-arid environments with precipitation peaks in late fall or early summer.<sup>2</sup> It inhabits coarse-textured, sandy or deep loamy soils with sunny, south/west facing slopes. It is tolerant of calcareous

and low-fertility soils but not acidic, nutrient poor soils.<sup>1</sup>

## Identification:

**Stems:** Are erect and can be slightly hairy and can range in height from 10 to 70 cm. There may be 1 to 20 tillers (stems) per plant. The entire plant turns from green to purple to brown/tan as it matures.<sup>2</sup>

**Leaves:** Are 4-16 cm long and 2-4 mm wide. Ligules are about 2 mm and membranous with entire or jagged edges. Auricles may be absent. Sheaths are closed to near the top and finely hairy.<sup>3</sup> Seedlings have bright green, hairy leaves.

**Flowers:** Downy brome has perfect flowers which are usually closed and self-pollinating, but is also capable of cross-pollination.<sup>1</sup> The inflorescence is a drooping, one-sided panicle with 5 to 8 florets.<sup>2</sup> Florets are 2-4 cm long including awns and are usually purple at maturity.<sup>2</sup>

## Prevention:

Most downy brome seeds fall near parent

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# Downy brome (Continued)

plant, but can be spread as a contaminant of grain, hay, straw and soil, or seed caching by rodents. The awns of the seeds can also attach themselves to clothing, shoelaces, and animal fur. Check clothes and pets when leaving an infested area. Downy brome requires some disturbance to establish.

## Control:

Downy brome is very persistent once established. Effective control must eliminate live plants, prevent seed formation, and control seed germination & emerging seedlings.<sup>1</sup> A combination of control methods, repeated through the growing season, for successive years has the best chance of success. Seed longevity is only a few years and germination rates are usually high.

**Grazing:** Downy brome has become an important early, but very short season forage in the intermountain west and grazing can prevent seed production if plants are grazed early. But downy brome palatability decreases rapidly and heavy spring grazing can also suppress desirable, perennial forage, allowing downy brome to proliferate. So grazing can both suppress and favour downy brome.<sup>1</sup> Grazing should be done before the plants turn purple in color to prevent seed formation. Invasive plants should never be considered as forage.

**Cultivation:** Sowing and fertilizing of desirable species to compete with downy brome is effective, especially when used to support other control methods and to fill any voids left by eliminated downy brome patches. Fire, as noted above, is a control method that requires experience.

**Mechanical:** Mowing may prevent seed set but since plants may be at different life stages, the possibility to disperse seeds is great; also culms will re-grow and produce seed. Tillage can be effective when combined with other control methods and must be deep enough (10-15 cm) to bury seeds.<sup>1</sup> Hand pulling is effective for small infestations and must be repeated. Be sure to get as much of the root system as possible and dispose of debris in landfill.



Seedlings

Richard Old, XID Services, Inc., Bugwood.org



Mature Plant

Steve Dewey, Utah State University, Bugwood.org



Roots

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

**Chemical:** Glyphosate (alone or in a product mix with Dicamba or 2,4-D) and Pyroxsulam are registered for use on downy brome. Always check product labels to ensure the herbicide is registered for use on the target plant in Canada by the Pest Management Regulatory Agency. Always read and follow label directions. Consult your local Agricultural Fieldman or Certified Pesticide Dispenser for more information.

**Biological:** Classical biological control of grasses such as *B. tectorum* poses problems regarding specificity, noting that many crops are also grasses. There has been considerable interest in using naturally occurring soil micro-organisms for weed control (Grey et al., 1995). Meyer et al. (2001) proposed the use of *U. bulata* as a biological control agent for *B. tectorum*.<sup>4</sup>



Stem

Fred Fishel, University of Missouri, Bugwood.org

## REFERENCES

- 1 USFS Fire Effects Information System <http://www.fs.fed.us/database/feis/plants/graminoid/brotec/introductory.html>
- 2 <http://www.agdepartment.com/NoxiousWeeds/pdf/Cheatgrass.pdf>
- 3 Hitchcock C.L. and Cronquist A. 1973. Flora of the Pacific Northwest.
- 4 <http://www.cabi.org/isc/?compid=5&dsid=10036&loadmodule=datasheet&page=481&site=144>