

# foxtail barley

## *Hordeum jubatum* L.

Synonyms: *Critesion geniculatum* Rafinesque, nom. illeg. superfl., *C. jubatum* (Linnaeus) Nevski, *Elymus jubatus* (Linnaeus) Link.

Other common name: squirreltail grass

Family: Poaceae

**Invasiveness Rank:** 63 The invasiveness rank is calculated based on a species' ecological impacts, biological attributes, distribution, and response to control measures. The ranks are scaled from 0 to 100, with 0 representing a plant that poses no threat to native ecosystems and 100 representing a plant that poses a major threat to native ecosystems.

### Description

Foxtail barley is a non-rhizomatous, annual to perennial grass that grows 30 ½ to 61 cm tall. It is native to western North America. Leaves are gray-green, rough, and 2 to 3 mm wide. Sheath margins have numerous soft hairs. Spikes are nodding, pale green to purple, and bushy. At maturity, spikes fade to a tawny color and become very brittle. Awns are 13 to 76 mm long. Seeds are elliptic, yellow-brown, and 6 mm long. Each seed has 4 to 8 awns and sharp, backward-pointing barbs (Hultén 1968, Royer and Dickinson 1999, Whitson et al. 2000).



*Hordeum jubatum* L.

*Similar species:* Foxtail barley can be distinguished from the non-native common barley (*Hordeum vulgare*) and the native meadow barley (*Hordeum brachyantherum*) by the length of its awns. Meadow barley has awns that are 13 mm long, foxtail barley has awns that are 13 to 76 mm long, and common barley has awns that are 10 to 15 cm long (Hultén 1968, Welsh 1974, Murry and Tai 1980).

### Ecological Impact

*Impact on community composition, structure, and interactions:* In early summer, foxtail barley is palatable to grazing animals. In late summer, however, the sharp awns may cause damage to the mouths, eyes, and skin of grazing animals. This species is a known host for a number of viruses (Woodcock 1925, Royer and Dickinson 1999, Whitson et al. 2000, MAFRI 2004). Foxtail barley hybridizes with *Agropyron* and *Hordeum* species. The hybrid *Hordeum brachyantherum* × *jubatum* is common in Alaska (Hultén 1968, Welsh 1974, Murry and Tai 1980).

*Impact on ecosystem processes:* Foxtail barley accumulates high amounts of salt in its leaves and roots, reducing the salinity of the soil (Badger and Ungar 1990, Keiffer and Ungar 2002).

### Biology and Invasive Potential

*Reproductive potential:* Foxtail barley reproduces entirely by seeds. Each plant is capable of producing more than 180 seeds. Tests in Alaska indicate that up to 67% of foxtail barley seeds remain viable after being buried in the soil for 1 year. The percentage of seeds that remain viable decreases as burial depth decreases and time buried increases. Less than 1% of buried seeds remain viable for 7 years (Badger and Ungar 1994, Conn and Deck 1995).

*Role of disturbance in establishment:* Foxtail barley has become more abundant because of soil contaminations and human activities that increase soil salinity (Badger and Ungar 1990, Robson et al. 2004).

*Potential for long-distance dispersal:* Seeds can be dispersed long distances by wind or animals (Royer and

Dickinson 1999, MAFRI 2004).

*Potential to be spread by human activity:* Foxtail barley has been grown as an ornamental plant. It is also a potential crop contaminant (USDA, ARS 2004).

*Germination requirements:* Foxtail barley produces two germination cohorts: one in the spring and one in the fall. Seed germination is inhibited by warm temperatures and salinity of more than 1%. Seeds require a period of darkness to germinate (Badger and Ungar 1994, Keiffer and Ungar 1997, Keiffer and Ungar 2002). Germination occurs at depths in the soil of 7 ½ cm or less (Royer and Dickinson 1999).

*Growth requirements:* Foxtail barley is adapted to a variety of soil textures, ranging from sandy loam to clay, with pH from 6.4 to 9.5. It requires fairly moist conditions and cannot sustain itself during long, dry periods (Tesky 1992). This species is salt resistant and typically restricted to soil that has between 0.3% and 0.9% salinity. Growth and development is inhibited when soil salinity is 1.0% or greater (Badger and Ungar 1990).

*Congeneric weeds:* Mouse barley (*Hordeum murinum*), little barley (*H. pusillum*), and common barley (*H. vulgare*) are known to occur as non-native weeds in North America (Whitson et al. 2000, USDA 2010).

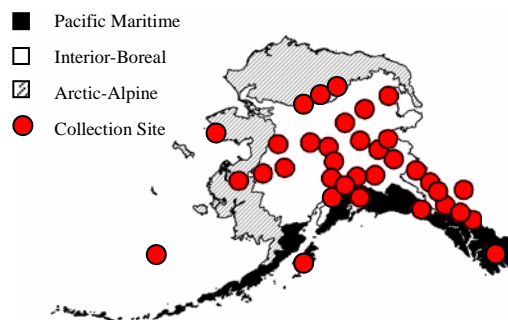
#### Legal Listings

- Has not been declared noxious
- Listed noxious in Alaska
- Listed noxious by other states
- Federal noxious weed
- Listed noxious in Canada or other countries (MB, QC)

#### Distribution and Abundance

Foxtail barley commonly grows in waste areas, roadsides, and open fields (Royer and Dickinson 1999). It is most prevalent on soils with high water tables and high salinities (Badger and Ungar 1990).

*Native and current distribution*<sup>1</sup>: Foxtail barley is native to western North America and has naturalized in eastern North America. The current range of foxtail barley includes most of the United States except for the south Atlantic and Gulf Coast states (ITIS 2010, USDA 2010). Judging from herbarium records (UAM 2010), foxtail barley is most likely to have been present in eastern interior Alaska prior to European contact. However, it appears to have spread dramatically in the last half century, a trend that is associated with the acceleration in anthropogenic disturbances. Foxtail barley has been documented from all three ecogeographic regions of Alaska (Hultén 1968, AKEPIC 2010, UAM 2010).



Distribution of foxtail barley in Alaska

#### Management

Once it has established, foxtail barley is difficult to eradicate. Planting disturbed areas with desirable plants and controlling water levels is effective in reducing populations of foxtail barley (Tesky 1992). This species can be controlled with herbicides (MAFRI 2004).

<sup>1</sup> The non-nativity of *Hordeum jubatum* is disputed. Control should only be applied to populations of which non-nativity is known or where plant is considered a nuisance weed.

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