

Quackgrass

Elymus repens (L.) Gould

Synonyms: *Agropyron repens* (L.) Beauv., *Elytrigia repens* (L.) Desv. ex B.D. Jackson, *Elytrigia vaillantiana* (Wulfen & Schreb.) Beetle, *Triticum repens* L., *Triticum vaillantianum* Wulfen & Schreb.

Other common name: dog grass, quickgrass, scotch, quitch, twitch

Family: Poaceae

Description

Quackgrass is a strongly rhizomatous perennial. The rhizomes are long and highly branched, yellowish-white, sharp-pointed, and somewhat fleshy. Its stems are erect and usually 1 to 3 feet tall. Leaf blades are ¼ to ½ inch wide, flat, pointed and have small auricles at the junction of blade and sheath. Leaf blades often have a diagnostic slight constriction at the tip. Blades are sparsely hairy above and hairless below. Spikelets are arranged in two long rows and born flatwise to the stem. The florets are awnless to short-awned. Seeds are elliptical, pale yellow to brown (Whitson et. al. 2000).



A number of *Lolium*, *Agropyron*, and *Elymus* grasses can be confused with quackgrass. However, quackgrass is rhizomatous, the leaves are broad, flat and slightly constricted at the tip, and spikelets are solitary.

Ecological Impact

Impact on community composition, structure, and interactions: Quackgrass is a strong competitor with cultivated crops and native grasses and forbs in prairies and grasslands. Where forming dense stands it can exclude regeneration of native woody species, and may also hinder the restoration of cropland, rangeland, pasture, and native grasslands. Additionally, it reduces the availability of soil moisture and limiting nutrients. Quackgrass can photosynthesize and grow during early spring, which may suppress species that photosynthesize and grow during the later, warmer part of season. This grass is allelopathic, producing ethylacetate extracts, cyclic hydroxamic acids and several other phytotoxins that may be exuded from its shoots and root and can suppress the growth or reproductive vigor of competing plants (FEIS 1996, Royer and Dickinson 1999, Whitson et al. 2000).

Impact on ecosystem process: Quackgrass may alter secondary succession following fires, where its cover can dramatically increase (FEIS 1996).

Biology and Invasive Potential

Reproductive potential: Quack grass is an aggressive perennial reproducing by seed and spreading by a shallow mass of rhizomes. Each stem can produce up to 400 seeds, although 20 to 40 is common. Seeds may remain dormant in the soil for 2 to 3 years (Batcher 2002). A plant may spread up to 3 m per year and can give rise to more than 200 new shoots (Royer and Dickinson 1999, Whitson et. al. 2000). It has no resprouting ability (USDA 2002).

Role of disturbance in establishment: This grass readily colonizes disturbed bared ground, but can invade undisturbed grassy habitats.

Potential for long-distance dispersal: Seeds dispersal mechanisms are unknown, although seeds remain viable after passing through the digestive systems of many domestic animals (Batcher 2002).

Potential to be spread by human activity: Many palatable hybrid crosses of quackgrass and other species have been developed and planted for livestock. It has been used to revegetate mine tailings (FEIS 1996).

Germination requirements: Seeds germinate either in the fall or spring. Alternating temperatures are required for germination (59° to 77° F diurnal fluctuations) (Batcher 2002).

Growth requirements: Quackgrass is adapted to coarse, fine and medium textured soils, pH 5.2 – 7.8. It is shade intolerant, no cold-stratification required for germination, it withstands temperatures to -43°F, and requires only 90 frost-free days. Optimum temperatures for growth are between 68° and 77°F. Rhizome growth seems to be favored by low temperatures (50°F) and long days (18 hours). This species has moderate summer porosity (FEIS 1996, USDA 2002).

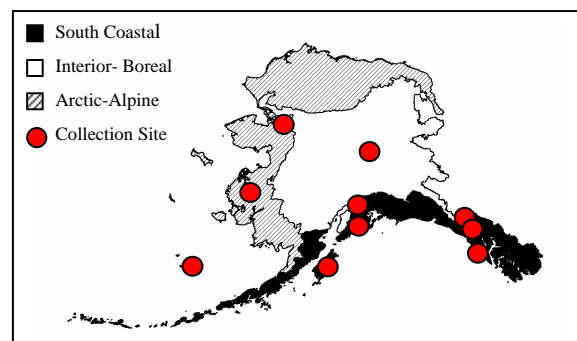
Listing: Listed as Noxious in 27 states of the United States and 5 Canadian provinces (Invaders Database System 2003, USDA 2002). It is classified as a noxious weed in Alaska (Seed regulations 1987).

Distribution and Abundance

Introduced from Europe as a contaminant in hay or straw, it was first reported in North America in 1672. It has now been reported from every state in the U.S. and throughout Canada. This invasive grass is found in numerous natural terrestrial grassland communities as well as in agricultural fields in the temperate North

America. It is early successional, and can invade gardens, yards, crop fields, roadsides, ditches, and other disturbed, moist areas. It can also colonize mixed-grass prairies and open woodlands. Some associate species of quackgrass include *Carex* spp., *Scirpus* spp., *Juncus* spp., *Bromus inermis*, *Poa pratensis*, and *Cirsium arvense* (FEIS 1996).

Native and current distribution: It is native to Eurasia (temperate Europe and Central Asia: Afghanistan, India, Pakistan). It is now found in South America (Argentina and Chile), North Africa, Australia, New Zealand, and Indonesia (Batcher 2002, Hultén 1968). It has been collected from all eco-regions in Alaska (Densmore et al. 2001, Hultén 1968, University of Alaska Museum 2003).



Distribution of quackgrass in Alaska.

Management

Successful control measures currently include applying herbicides, burning, tilling, and combinations of these three methods. Monitoring for two years after treatment is recommended (Batcher 2002).

References:

- Batcher, M.S. 2002. Element Stewardship Abstract for *Elytrigia repens* var. *repens* (L.) Desv. ex B.D. Jackson Synonyms: *Agropyron repens* L. (Beauv.), *Elymus repens* (L.) Gould Quackgrass. The Nature Conservancy. Arlington, VA.
- Densmore, R. V., P. C. McKee, C. Roland. 2001. Exotic plants in Alaskan National Park Units. FEIS - Fire Effects Information System (Online) (1996). Prescribed Fire and Fire Effects Research Work Unit, Rocky Mountain Research Station (producer). Available: www.fs.fed.us/database/feis/ (1998, March 12).
- Hultén, E. 1968. Flora of Alaska and Neighboring Territories. Stanford University Press, Stanford, CA. 1008 pp.
- Invaders Database System. The University of Montana. 2003. Montana Noxious Weed Trust Fund. Department of Agriculture. <http://invader.dbs.umt.edu/>
- ITIS – Integrated Taxonomic Information System. 2002. <http://www.itis.usda.gov>
- Royer, F. and R. Dickinson. 1999. Weeds of the Northern U.S. and Canada. The University of Alberta press. 434 pp.
- Seed regulations. 1987. State of Alaska, Department of Natural Resources, Division of Agriculture. Palmer, Alaska.
- University of Alaska Museum. University of Alaska Fairbanks. 2003. <http://hispidamuseum.uaf.edu:8080/home.cfm>

USDA (United States Department of Agriculture),
NRCS (Natural Resource Conservation
Service). 2002. The PLANTS Database,
Version 3.5 (<http://plants.usda.gov>). National
Plant Data Center, Baton Rouge, LA 70874-
4490 USA.

Whitson, T. D., L. C. Burrill, S. A. Dewey, D. W.
Cudney, B. E. Nelson, R. D. Lee, R. Parker.

2000. Weeds of the West. The Western
Society of Weed Science in cooperation with
the Western United States Land Grant
Universities, Cooperative Extension
Services. University of Wyoming. Laramie,
Wyoming. 630 pp.

Alaska Natural Heritage Program
Environment and Natural Resources Institute
University of Alaska Anchorage
707 A Street, Anchorage, Alaska 99501
Phone (907) 257-2780 Fax (907) 257-2789

Last Updated May 3, 2006