wild oat

Avena fatua L.

Synonyms: *Avena fatua var. glabrata* Peterm.; *A. fatua var. vilis* (Wallr.) Hausskn.; *Anelytrum avenaceum* Hack.; *A. intermedia* T. Lestib.; *A. lanuginosa* Gilib.; *A. meridionalis* (Malzev) Roshev.; *A. patens* St.-Lag.; *A. pilosa* Scop.; *A. septentrionalis* Malzev; *A. vilis* Wallr.; *A. fatua ssp. meridionalis Malzev; A. fatua var. intermedia* Vasc.*; A. fatua var. vilis* (Wallr.) Malzev; *A. sativa var. fatua* (L.) Fiori; *A. sativa var. sericea* Hook.
Other common name(s): wild oats, flaxgrass, oatgrass
Family: Poaceae

Invasiveness Rank: **Not Ranked -** 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

Avena fatua is an annual grass, often tufted, green or light green, that grows from a fibrous root system. Stems are smooth, cylindric, erect, 80 to 150 cm high, and with dark-colored nodes. Leaf blades are linear-lanceolate, flat, 20 to 30 cm long, 4 to 10 mm wide and twisted counterclockwise. Leaf sheaths are open, with transparent and slightly hairy edges. Ligules are membranous and usually about 5 mm long. Panicle is with sides of equal shape and length, 10 to 40 cm long, open and loose. Spikelets are large and conspicuous, occurring singly at the end of branches, nodding, each with two glumes containing three florets. Glumes are membranous with 9 to 11 nerves and are longer than the florets within them. Lemmas can be hairy or glabrous, light yellow, grey, brown or black and with several veins. Callus at the base of the first floret usually covered with dense hairs. Two of three florets usually perfect. Each floret with a long, bent and twisted awn 3-4 cm long. Seeds elliptical, 1 cm long. (Sharma and Vanden Born 1978) (Skinner et al. 2012).

Figure 1 Wild oat (Avena fatua). Photo by Jan Samanek.

Similar Species: Common oat *(A. sativa)* can be confused with wild oat. Wild oat can be distinguished by the presence of spikelets with 3 florets and 2 to 3 awns rather than 2 florets and 1 awn seen in common oat (Hultén 1968). When compared to common oat, wild oat is also taller and has a more whitish color to its straw and chaff at maturity (Beckie et al. 2012).

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Figure 2 Wild oat (Avena fatua). Photo by Steve Dewey.

Ecological Impact

Impact on community composition, structure, and interactions: A notorious agricultural weed in North America. Wild oat is known to produce allelopathic compounds capable of reducing the germination of native annual plants and decreasing their competitive ability. In dense quantities, it can control the composition of annual grasslands. (Tinnin and Muller 1972).

Impact on ecosystem processes: Wild oat develops large root systems, making it highly successful in nutrient uptake and monopolizing resources (Haynes et al., 1991).

Biology and Invasive Potential

Reproductive potential: Wild oat has high reproductive potential and is highly adaptable to a wide range of environments (CABI 2017). Individual plants may produce up to 500 seeds per growing season, but 100 to 150 is the typical yield. In Alaska, its establishment has been limited to disturbed habitats and roadsides. Major success in agricultural areas of Canada warrants concern of potential expansion into agricultural hotspots such as the Matanuska-Susitna Valley in Southcentral Alaska (Sharma and Vanden Born 1978).

Role of disturbance in establishment: Wild oat is highly successful in agricultural soils and other disturbed habitats.

Potential for long-distance dispersal: Wild oat is likely dispersed by wind and water to some extent, but natural dispersal is limited and most seed can be found near the parent plant after ripening. Wild oat has no other specialized adaptations for dispersal (Barroso et al. 2006, Sharma and Vanden Born 1978). Mallards in North Dakota can lightly feed on wild oat (Swanson et al. 1985).

Potential to be spread by human activity: The most likely method of seed dispersal of wild oat is via the use and transportation of construction and agricultural equipment, and more specifically associated with cereal crop production and grain transportation (Wheeler et al. 2001).

Germination requirement: Wild oat may germinate in a range of soil temperatures. Ideal temperature ranges can vary from 59-68o F (Koch and Hurle, 1978; Fernandez-Quintanilla et al., 1990; Hassanein et al., 1996) to 39-46o F (Murdoch 1983). This variability is likely due to genetic diversity within the species driven by local adaptations. After burial, the seed bank viability of this species is prone to decline by up to 80% annually, but with at least 1-7% viable after 9

years (Miller and Nalewaja 1983). Shallow tillage that lightly buries wild oat seeds has been shown to increase germination rates (Sharma and Vanden Born 1978).

Growth requirements: Wild oat is present and successful over a wide range of climates. It has been shown to prefer clay or clay loam substrate but may establish in a variety of soil types (Akey and Morrison 1984). Wild oat is most successful in agricultural environments where supplemental nitrogen and phosphorus are provided (Haynes et al., 1991). Alaska's Interior and Arctic ecogeographic regions have climatic limiting factors that may prohibit successful growth of this species. However, with Alaska's changing climate, non-native species could have greater opportunity for establishment within more favorable ecological niches such as warm areas near roadsides or along floodplains (Carlson et al 2016).

Legal Listings

- Listed noxious in Alaska
- Listed noxious by other states (MI)
- Listed noxious in Canada or other countries. (BC, QC, MB, SK).

Distribution and Abundance

Native and current distribution: Wild oat is native to northern Africa, temperate and tropical Asia, and Europe (USDA, ARS 2017). Outside the native range, it is most commonly found in disturbed habitats including agricultural fields and roadsides but has also become naturalized in Canadian grasslands (Becky et al. 2012). It grows as a weed in most temperate regions of the world and can be found in 43 US states and all Canadian provinces apart from the Yukon Territory, Nunavut, and Labrador (USDA, NRCS 2017, Brouillet et al. 2010+). Wild oat has been documented in the Interior, Southcentral and Southeast regions of Alaska, though infrequently (AKEPIC 2025, CPNWH 2017). It has not been observed in undisturbed habitats in Alaska (Densmore et all. 2001, AKEPIC 2025, CPNWH 2017). For the most up-to-date distribution information for Alaska, please visit the AKEPIC Database.

Management

Listed previously as the second most herbicide resistant prone weed in the world (Heap 2003). Effective non-chemical approaches to management include soil cultivation and crop rotation (Zorner et al. 1984). Selective herbicides may be effective if chosen carefully. Herbicides from the urea group have been shown to successful control agents. (CABI 2017).

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