

perennial ryegrass

Lolium perenne L.

Synonyms: *Festuca perennis* (L.) Columbus J. P. Sm., *Lolium brasilianum* Nees, *L. canadense* Bernh. ex Rouville, *L. latum* Roth ex Steud., *L. marschallii* Steven, *L. montevidense* Rouville, *L. multiflorum* ssp. *ramosum* Guss. ex Arcang., *L. multiflorum* var. *ramosum* Guss. ex Arcang., *Lolium perenne* var. *aristatum* Willd., *L. perenne* var. *brasilianum* (Nees) Kuntze, *L. perenne* var. *compressum* Sibth., *L. perenne* var. *cristatum* Pers., *L. perenne* var. *pacyi* Sturtev., *L. perenne* ssp. *perenne* L., *L. perenne* var. *perenne* L., *L. perenne* var. *tenue* (L.) Huds., *L. tenue* L.

Other common names: crested ryegrass, English ryegrass, perennial rye grass

Family: Poaceae

Invasiveness Rank: 52 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.

Note on Taxonomy: Some botanists treat *Lolium perenne* and *Lolium multiflorum* as two subspecies of *Lolium perenne* because these taxa can form highly fertile hybrids and *Lolium multiflorum* may have originated from *Lolium perenne* as an early agricultural cultivar (Sullivan 1992, DiTomaso and Healy 2007). However, because *Lolium perenne* is a perennial grass while *Lolium multiflorum* is an annual or biennial grass, we adopt the view of recent treatments that recognize these taxa as separate species (Terrell 2007, Dzyubenko and Dzyubenko 2009, Klinkenberg 2010, ITIS 2011).

Description

Perennial ryegrass is a tufted, perennial grass that grows 30 to 100 cm tall from short rhizomes and tillers. The entire plant is glabrous. Stems are erect. Leaves are dark green, shiny on the lower side, distinctly veined, 5 to 30 cm long, and 2 to 4 mm wide. Blades are flat on mature shoots and folded on young shoots. Auricles are narrow and up to 3 mm long or, rarely, absent. Ligules are green to transparent and 0.5 to 2.5 mm long. Spikes are 3 to 30 cm long and consist of 5 to 37 spikelets. Inflorescence axes are often flexuous and 0.5 to 2.5 mm thick at the nodes. Spikelets are sessile, 5 to 22 mm long, and 1 to 7 mm wide with five to nine florets each. All spikelets except the terminal spikelets have only one glume. Glumes are 3.5 to 15 mm long and half as long as to slightly exceeding the length of the spikelet. Lemmas are 3.5 to 9 mm long and 0.8 to 2 mm wide. Awns are usually absent but are rarely present at lengths up to 8 mm long. When present, awns are attached to the lemmas 0.2 to 0.7 mm below the tips. Seeds are 3 to 5.5 mm long and 0.7 to 1.5 mm wide (Terrell 2007, eFloras 2008, Dzyubenko and Dzyubenko 2009, Klinkenberg 2010).



Stem, spike, and leaf of *Lolium perenne* L.

Similar species: Perennial ryegrass can be confused with Italian ryegrass (*Lolium multiflorum*), a closely related annual grass that has also been introduced to Alaska. Perennial ryegrass and Italian ryegrass form fertile hybrids, which can complicate identification. Italian ryegrass can be distinguished from perennial ryegrass by the presence of more (10 to 22) florets per spikelet and lemmas that are usually awned with awns up to 15 mm long. Darnel ryegrass (*L. temulentum*), which is also not native to Alaska, can be distinguished from perennial ryegrass by its annual growth habit and the presence of

awns up to 23 mm long. *Lolium* species can be distinguished from *Festuca* species and other similar grass genera by the presence of 2 to 25 florets per spikelet, lemmas that are unawned or apically awned with straight awns, and sessile spikelets with only one glume per spikelet except for the terminal spikelets (Terrell 2007).



Mounted specimen of *Lolium perenne* L.

Ecological Impact

Impact on community composition, structure, and interactions: Perennial ryegrass forms tufts (Beddows 1967, Klinkenberg 2010) that may increase the density of graminoid layers. When seeded at high densities, perennial ryegrass can reduce the growth of surrounding vegetation (Sullivan 1992). In Alaska, 25% of infestations occur at or above 30% ground cover (AKEPIC 2011), suggesting that this species may have the potential to reduce native plant populations. However, most infestations occur in anthropogenically disturbed areas (AKEPIC 2011). Perennial ryegrass hybridizes with other *Lolium* species as well as occasionally with some *Festuca* species (eFloras 2008). It is palatable to large mammals, upland game birds, and waterfowl (Sullivan 1992, Wright 2008). In northern California, this species has been associated with a fungus that causes trembling, staggering, and seizures in cattle and sheep (DiTomaso and Healy 2007). Perennial

ryegrass is affected by many fungal diseases, including ergot (*Claviceps purpurea*) (Sullivan 1992).

Impact on ecosystem processes: As a tufted grass, perennial ryegrass binds soil, thereby decreasing erosion (eFloras 2008). This species decreases soil moisture and nutrient availability (Mattner and Parbery 2001, GOERT 2009). Dry litter accumulation increases fire hazards (GOERT 2009).

Biology and Invasive Potential

Reproductive potential: Perennial ryegrass reproduces sexually by seeds and vegetatively from tillers (Beddows 1967). Individual inflorescences produce between 45 and 333 seeds (Beddows 1967, Terrell 2007). Seed banks are generally transient (DiTomaso and Healy 2007, GOERT 2009) with minimal germination after one year (Roberts 1986).

Role of disturbance in establishment: Perennial ryegrass is shade intolerant (Sullivan 1992) and is not likely to establish under closed canopies. In Alaska, perennial ryegrass primarily establishes in anthropogenically disturbed sites but can also establish in naturally disturbed sites, such as areas disturbed by coastal processes or glaciation (AKEPIC 2011).

Potential for long-distance dispersal: Seeds are relatively heavy and compact (Beddows 1967). Most seeds land near the parent plant (DiTomaso and Healy 2007).

Potential to be spread by human activity: Perennial ryegrass is cultivated as a forage and lawn grass (Sullivan 1992, eFloras 2008). It is recommended as a commercially available grass for revegetation work (Wright 2008) and has been seeded for revegetation in multiple locations in Alaska (Rapp 2009, AKEPIC 2011). This species has been identified as a contaminant in ryegrass straw and wheat straw imported from Washington and Oregon (Conn et al. 2010).

Germination requirements: Seeds can germinate immediately after maturation if soil moisture is sufficient. They tolerate a wide range of diurnal temperature fluctuations and will germinate in either light or darkness. In California, germination often occurs in late summer (Beddows 1967, Sullivan 1992).

Growth requirements: Perennial ryegrass grows in a wide range of soil types and moisture conditions, including short periods of flooding. It grows best in deep, nutrient-rich, moist loam with pH between 6 and 7. It is moderately tolerant of saline conditions. This species does not tolerate shade, drought, or extended periods of low temperatures or frost (Beddows 1967, Sullivan 1992, Dzyubenko and Dzyubenko 2009).

Congeneric weeds: Persian ryegrass (*Lolium persicum*) is considered a noxious weed in Alberta, Manitoba, Saskatchewan, and Texas, and darnel ryegrass (*L. temulentum*) is considered a noxious weed in Alabama, Louisiana, Mississippi, Oklahoma, and Texas (Invaders 2011). Italian ryegrass (*L. multiflorum*) is known to

occur as a non-native weed in Alaska with an invasiveness rank of 41 (AKEPIC 2011).

Legal Listings

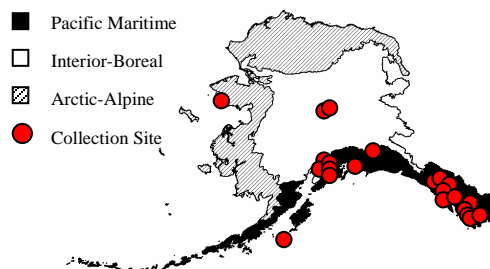
- Has not been declared noxious
- Listed noxious in Alaska
- Listed noxious by other states
- Federal noxious weed
- Listed noxious in Canada or other countries

Distribution and Abundance

Perennial ryegrass is extensively cultivated in much of the world as a forage or pasture grass. Seeds are included in some lawn seed mixtures. This species is also planted to stabilize soils and reduce erosion (Sullivan 1992, Terrell 2007, eFloras 2008, Dzyubenko and Dzyubenko 2009). In Tennessee and Virginia, it has been planted on eroded mine spoils, and in Utah, it has been planted to stabilize streambanks (Sullivan 1992). This species has been used for revegetation work in Alaska (Wright 2008, Rapp 2009, AKEPIC 2011). Perennial ryegrass has been documented growing in continuously grazed riparian corridors in Wisconsin (Paine and Ribic 2002) and is known to grow in riparian pastures in the Pacific Northwest (Griffiths et al. 1997). It grows in wetlands in California (Sullivan 1992).

Native and current distribution: Perennial ryegrass is native to Europe, temperate Asia, and North Africa (Beddows 1967, Terrell 2007, eFloras 2008). It has been introduced to North America, South America, southern Africa, Australia, and New Zealand (Beddows 1967, Terrell 2007, GOERT 2009). This species grows in all

states of the U.S. and most of Canada (USDA 2011). It is known to grow in arctic regions of Europe and western Russia (Dzyubenko et al. 2004, Elven 2007). Perennial ryegrass has been documented from all three ecogeographic regions of Alaska (Hultén 1968, AKEPIC 2011, UAM 2011).



Distribution of perennial ryegrass in Alaska

Management

An infestation of perennial ryegrass at Bartlett Cove, Glacier Bay National Park, did not persist more than three years (Rapp 2009), suggesting that this species may naturally be replaced by native species in some cases. Perennial ryegrass has low tolerance to cold conditions (Beddows 1967), which suggests that populations may not persist in the colder regions of Alaska. Small patches can be removed by hand-pulling in spring or early summer before seed set (GOERT 2009). Controlled sites should be revisited as plants regenerate from the roots after the removal of the aboveground growth (Sullivan 1992).

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