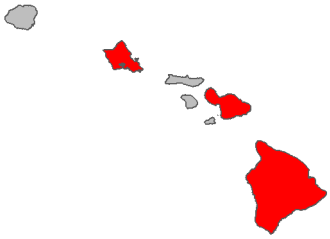
Fire risk report for *Lolium perenne*

Full Species Name *Lolium perenne* L.
Family: Poaceae
Common names: perennial ryegrass
Synonyms:
Known occurrences (as of 2020) 
Year first documented as naturalized in Hawai'i: 1909
This species has been ranked by the Hawai'i Weed Risk Assessment program as High Risk with a score of 15.
View photos on Starr Environmental
View on Wikipedia
View occurrences on iNaturalist
View at Plants of Hawaii
View photos on Flickr

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Lowest risk ⇔ Highest risk

This species is likely a **low** fire risk in Hawai'i with a fire risk score of **0.25**.

This species was ranked by our machine learning algorithm using the data presented on the next page. A predicted score of > .34 suggests the plant is a high fire risk.

Summary of Fire ecology	
Native habitat fire proneness	No Data
Fire promoting plant in its native range	No
Fire promoting plant in its introduced range*	No
Regenerates after fire	Yes
Promoted by fire	Yes
Reported flammable*	No Data
Relative is flammable*	No

*These values were used by the model to predict fire risk

Detailed summary of Fire Ecology

Native habitat fire proneness (In any part of the plant's native range is its habitat described as fire prone due to natural or human caused fires?)	No Data	
Fire promoting plant in its native range (Does the species act as a major fuel source, increase fire severity, frequency, or modify fuel bed characteristics within its native range?)	No	
Fire promoting plant in its introduced range (Same as Fire Promoting Native but within the species introduced range)	No	"As with most perennial grasses, perennial ryegrass is well adapted to fire. It is top-killed and will sprout quickly from the rhizome. Fire is beneficial to grass swards; by removing litter, it allows more light to penetrate to the leaf bases and new tillers [59]." https://www.fs.fed.us/database/feis/plants/graminoid/lolperp/all.html#FIRE%20ECOLOGY --- "Zedler et al (189) demonstrated that seeding burned California chaparral with the alien annual Lolium perenne as an erosion control measure fueled a second fire in an area that had burned less than 1 year previously." #Not natural conditions as the grass was intentionally seeded in and hardly under equalibrium. Not counting this source but keeping it here for posterity D'Antonio, C. M., & Vitousek, P. M. (1992). Biological invasions by exotic grasses, the grass/fire cycle, and global change. Annual review of ecology and systematics, 23, 63-87
Regenerates after fire (Does the plant regrow after fire by any means? This includes resprouters, reseeders,	Yes	"PLANT RESPONSE TO FIRE: Fire stimulates the production of reproductive tillers in perennial ryegrass [14]. When field burning was initiated on seed fields in Oregon, seed yields tripled [21]."

and recruiters which dispersed into the area within approximately one year post fire)		https://www.fs.fed.us/database/feis/plants/graminoid/lolperp/all.html#FIRE%20ECOLOGY
Promoted by fire (Does the plant increase in abundance after a fire?)	Yes	"As with most perennial grasses, perennial ryegrass is well adapted to fire. It is top-killed and will sprout quickly from the rhizome. Fire is beneficial to grass swards; by removing litter, it allows more light to penetrate to the leaf bases and new tillers [59]." https://www.fs.fed.us/database/feis/plants/graminoid/lolperp/all.html#FIRE%20ECOLOGY
Reported flammable (Is the species described as being flammable, being a major wildfire fuel, or high fire risk?)	No Data	"Non-native grasses are present in most Garry oak ecosystems and may cover a combined total of 50-80 percent of the landscape ... Perennial ryegrass also readily establishes and spreads on disturbed and bare soils. Competition for water continues throughout the year, becoming critical during the dry summer months. As the grasses die off, they form a dense litter layer that blocks light and thus suppresses the regeneration and establishment of native species. The litter also provides fuel and creates conditions for detrimental high-intensity fires." # - this was for the grass when planted in. Not under natural conditions, therefore I'm keeping this source for posterity but not counting it as a datapoint Garry Oak Ecosystems Recovery Team. 2003. Invasive species in Garry Oak and associated ecosystems in British Columbia. Garry Oak Ecosystems Recovery Team, Victoria, BC
Relative is flammable (Does a plant in the same genus meet the Reported Flammable criteria?)	No	

Text in quotes are direct quotes from the source
Text in square brackets was added by the assessor to clarify something or to summarize from a figure.
Text preceded by a “#” is comment from the assessor

The data presented were assembled from literature and database searches for each species using as much data as could be collected regarding the plant’s fire ecology under natural conditions. Searches aimed to be exhaustive and consist of as much data as could be located in

2020. Our machine learning algorithm was trained on 49 species of plants which had their fire risk ranked by 49 managers in Hawai'i in November 2020. The model used a conditional random forest regression algorithm to predict scores for each species using the manager score as the response variable and the fire ecology traits of each plant as the predictor variables to generate a fire risk score. This trained model was then used to predict the fire risk for all species which were not ranked by managers. The model was calibrated such that it is 90% accurate at predicting high fire risk plants and 79% accurate at predicting low fire risk plants. This research and the resulting fire risk model has been published in the journal Biological Invasions by Kevin Faccenda and Curt Daehler (both at the University of Hawai'i at Mānoa).

Note that the analysis doesn't account for a plant species' spatial distribution, population density, or distinct climate and ecosystem conditions (which can also influence fire risk). The fire risk of these species are mostly under "worst case" environmental conditions where the climate is dry enough to maintain fire, but wet enough to allow for plant growth and fuel accumulation. The fire risk ranking should not be taken as a stand-alone risk metric in prioritizing weed control efforts. Rather, this information may also be useful for determining if a newly discovered species poses a potential fire threat in wildland areas.

More general information on the weed risks and ecology of non-native plants in Hawai'i is available from the Hawai'i Invasive Species Committee's Weed Risk Assessment database.

View more fact sheets at https://www.pacificfireexchange.org/weed-fire-risk-assessments

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Fact sheet prepared by Kevin Faccenda (faccenda@hawaii.edu) in November 2021. Data were prepared by Kevin Faccenda in 2020.

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