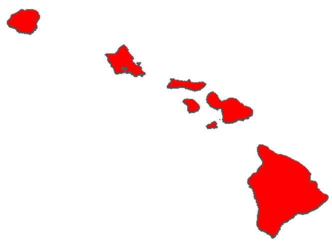
Fire risk report for *Melinis repens*

Full Species Name *Melinis repens* (Willd.) Zizka
Family: Poaceae
Common names: Natal redtop Natal grass
Synonyms:
Known occurrences (as of 2020) 
Year first documented as naturalized in Hawai'i: 1903
This species has not yet been ranked by the Hawai'i Weed Risk Assessment program as of 2020.
View photos on Starr Environmental
View on Wikipedia
View occurrences on iNaturalist
View at Plants of Hawaii
View photos on Flickr

0	.5	1
Lowest risk	⇔	Highest risk

This species is likely a **high** fire risk in Hawai'i with a fire risk score of **0.59**.

This species was ranked by 49 managers on a scale of 'no risk', 'low risk', 'medium risk', or 'high risk'. The numerical score ranges from 0 to 1 with higher scores indicating more managers considered it a higher risk. A score of > .31 indicates high 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*	Yes
Regenerates after fire	Yes
Promoted by fire	Yes
Reported flammable*	High
Relative is flammable*	Yes

*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)	Yes	"However, in some grassland where the botanical composition of natal grass was 82 %, burning did not reduce this dominance(67). " Castillo, A. M., Balandran Valladares, M. I., Mata-González, R., & Pinedo Alvarez, C. (2014). Biology of natal grass Melinis repens (Willd.) and implications for its use or control. Review. Revista Mexicana de Ciencias Pecuarias, 5(4), 429-442. ---------------------------- "Regarding species composition, we found a very high cover of the exotic grass M. repens in HF. This species was reported as a very invasive grass that promotes fires, becuase it accumulates very flammable biomass (Van Devender, Felger, & Búrquez, 1997; David & Menges, 2011)" Kowaljow, E., Morales, M. S., Whitworth-Hulse, J. I., Zeballos, S. R., Giorgis, M. A., Rodríguez Catón, M., & Gurvich, D. E. (2019). A 55-year-old natural experiment gives evidence of the effects of changes in fire frequency on ecosystem properties in a seasonal subtropical dry forest. Land Degradation & Development, 30(3), 266-277.
Regenerates after fire (Does the plant regrow after fire by any	Yes	"Hernández-Quiroz (2010) found that natalgrass seedling emergence in Chihuahua, Mexico grasslands was unaffected by prescribed fire."

means? This includes resprouters, reseeders, and recruiters which dispersed into the area within approximately one year post fire)		https://bugwoodcloud.org/CDN/floridainvasives/Heartland/Stokes_C_Biology_Ecology_and_Management_of_Melinis_repens.pdf Stokes, C. A. (2010). Biology, Ecology and Management of Natalgrass (melinis Repens) (Doctoral dissertation, University of Florida). ---------------------------- "Typically natal grass reseeds and resprouts vigorously following fire and quickly invades disturbed areas. In several areas in south Florida, natal grass has invaded scrub habitat following fire. Mowing will not provide control" https://plants.ifas.ufl.edu/plant-directory/melinis-repens/
Promoted by fire (Does the plant increase in abundance after a fire?)	Yes	"Typically natal grass reseeds and resprouts vigorously following fire and quickly invades disturbed areas. In several areas in south Florida, natal grass has invaded scrub habitat following fire. Mowing will not provide control" https://plants.ifas.ufl.edu/plant-directory/melinis-repens/
Reported flammable (Is the species described as being flammable, being a major wildfire fuel, or high fire risk?)	High	"Regarding species composition, we found a very high cover of the exotic grass M. repens in HF. This species was reported as a very invasive grass that promotes fires, becuase it accumulates very flammable biomass (Van Devender, Felger, & Búrquez, 1997; David & Menges, 2011)" Kowaljow, E., Morales, M. S., Whitworth-Hulse, J. I., Zeballos, S. R., Giorgis, M. A., Rodríguez Catón, M., & Gurvich, D. E. (2019). A 55-year-old natural experiment gives evidence of the effects of changes in fire frequency on ecosystem properties in a seasonal subtropical dry forest. Land Degradation & Development, 30(3), 266-277.
Relative is flammable (Does a plant in the same genus meet the Reported Flammable criteria?)	Yes	"Molassesgrass is highly flammable [21,22,30], quick burning [22], and promotes fire [46] by increasing vegetation horizontal continuity in invaded communities [8]." https://www.fs.fed.us/database/feis/plants/graminoid/melmin/all.html#FIRE%20ECOLOGY"

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 Hawaiʻi 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 Hawaiʻi is available from the Hawaiʻi 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.

This research was funded by the Department of the Interior Pacific Islands Climate Adaptation Science Center. The project described in this publication was supported by Grant or Cooperative Agreement No.G20AC00073 to Curt Daehler from the United States Geological Survey. The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Geological Survey. Mention of trade names or commercial products does not constitute their endorsement by the Pacific Islands Climate Adaptation Science Center or the National Climate Adaptation Science Center or the US Geological Survey.