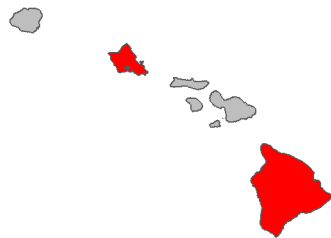


Fire risk report for *Ziziphus mauritiana*

Full Species Name <i>Ziziphus mauritiana</i> Lam.
Family: Rhamnaceae
Common names: Indian jujube
Synonyms:
Known occurrences (as of 2020) 
Year first documented as naturalized in Hawai'i: 2010
This species has been ranked by the Hawai'i Weed Risk Assessment program as High Risk with a score of 9.
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 **low** fire risk in Hawai'i with a fire risk score of **0.16**.

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	Non Fire-prone
Fire promoting plant in its native range	No
Fire promoting plant in its introduced range*	No
Regenerates after fire	Yes
Promoted by fire	No
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?)	Non Fire-prone	<p>"the jujube is one of the world's major fruit crops and is cultivated in India, Russia, the Middle East, southern Europe, and especially China. ...The present natural distribution of the jujube is from southeastern Europe to China"</p> <p>Anderson, Loran, and Anne Thistle. "The Jujube (<i>Ziziphus Jujuba</i> Mill.), a Multipurpose Plant." <i>Economic Botany</i> 56, no. 2 (July 1, 2002): 198–200.</p> <p>-----</p> <p>"Some species, like <i>Z. mauritiana</i> occur in nearly every continent. It is an example of an extremely drought-hardy species and is a dominant component of the natural vegetation of the Indo-Pak deserts."</p> <p>Razi, Muhammad, Raheel Anwar, S Basra, Muhammad Khan, and Iqrar Khan. "MORPHOLOGICAL CHARACTERIZATION OF LEAVES AND FRUIT OF JUJUBE (<i>Ziziphus Mauritiana</i> Lamk.) GERMPLASM IN FAISALABAD, PAKISTAN." <i>Pakistan Journal of Agricultural Science</i> 50, no. 2 (2013): 211–16.</p>
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	
Regenerates after fire (Does the plant regrow after fire by any means? This includes resprouters, reseeder, and recruiters which	Yes	<p>"However, only about 10% of small <i>Z. mauritiana</i> were killed. Most plants of <i>Z. mauritiana</i> resprouted vigorously within three months of the fire."</p> <p>https://doi.org/10.1111/j.1442-9993.1997.tb00640.x</p> <p>Grice, A. C. (1997). Post-fire regrowth and survival of the invasive tropical shrubs <i>Cryptostegia grandiflora</i> and</p>

dispersed into the area within approximately one year post fire)		Ziziphus mauritiana. Australian Journal of Ecology, 22(1), 49-55.
Promoted by fire (Does the plant increase in abundance after a fire?)	No	" The responses of Indian jujube to fire have also been investigated. Seed present on the soil surface during an intense fire suffers high mortality even though enclosed in the woody endocarp (Grice and Brown 1996b). However, established plants experience little to no mortality. Mortality, when it occurs, is restricted to about 10% of plants less than 100 cm high (Grice 1997). Most plants rapidly recover their canopies after mid-dry season fires. Smaller plants sprout from the base, and larger plants produce new shoots from the canopy (Grice 1997; Grice and Brown 1996b). https://www.jstor.org/stable/pdf/4046066.pdf Grice, A. C. (1998). Ecology in the management of Indian jujube (Ziziphus mauritiana). Weed Science, 467-474.
Reported flammable (Is the species described as being flammable, being a major wildfire fuel, or high fire risk?)	No Data	
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>

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

