Fire risk report for *Melia azedarach*

Full Species Name
Melia azedarach L.

Family: Meliaceae

Common names:
chinaberry
pride-of-India
bead tree
Indian lilac

Synonyms:

Known occurrences (as of 2020)

Year first documented as naturalized in Hawai'i: 1916

This species has been ranked by the Hawai'i Weed Risk Assessment program as High Risk with a score of 14.

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 **0.22**.

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*	No
Regenerates after fire	Yes
Promoted by fire	Yes
Reported flammable*	Low
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	
Regenerates after fire (Does the plant regrow after fire by any means? This includes resprouters, reseeders, and recruiters which dispersed into the area within approximately one year post fire)	Yes	"Melia azedarach L., a weedy tree that typically reproduces by seeds, may exhibit clonal growth following disturbance (e.g. fire, herbivory, animal injury)... Several attempts have been made in the past to control the spread of this alien species, which involved the use of chemical treatments, prescribed fires or tree fellings. These treatments, far from halting its advance, induced prolific resprouting which has almost certainly contributed to the increase of the population not only in terms of area occupied but also in density, transforming a few individuals into a dense stand" https://www.researchgate.net/profile/G_Tourn/publication/262414691_Clonal_strategies_in_a_woody_weed_Melia_azedarach/links/0c960538f894d5413f000000.pdf Tourn, G. M., Menvielle, M. F., Scopel, A. L., & Pidal, B. (1999). Clonal strategies of a woody weed: Melia azedarach. Plant and soil, 217(1-2), 111-117. ----------

		"Melia azedarach was the invader most sensitive to heat shock, with its germination being reduced even under the lowest heat index. This high sensitivity might slow the spread of this species, regardless of its high below-ground resprouting ability at the adult stage (Herrero et al. 2016). This result suggests that M. azedarach is an obligate resprouter in the invaded ecosystems (i.e. plants that lack a fire-resistant seed bank and rely on resprouting to regenerate after fire, sensu Pausas & Keeley 2014)." Moreschi, E. G., Funes, G., Zeballos, S. R., & Tecco, P. A. (2019). Post-burning germination responses of woody invaders in a fire-prone ecosystem. Austral Ecology, 44(7), 1163-1173. ----------
Promoted by fire (Does the plant increase in abundance after a fire?)	Yes	"Melia azedarach and Gleditsia triacanthos resprouted from below-ground tissues such as roots often several meters away from the bunt crown, which is in accordance with Waggy (2009) who point out the ability of these species for invading open sites (Fig. 3b)." Herrero, M. L., Torres, R. C., & Renison, D. (2016). Do wildfires promote woody species invasion in a fire-adapted ecosystem? Post-fire resprouting of native and non-native woody plants in central Argentina. Environmental management, 57(2), 308-317. ---------- "Chinaberry was not found in BSP prior to the wildfire, but appears to have dispersed to higher moisture areas following the fire." Booth, E. M. (2017). Factors determining post-wildfire plant community recovery trajectories in Central Texas (Doctoral dissertation).
Reported flammable (Is the species described as being flammable, being a major wildfire fuel, or high fire risk?)	Low	"[low flammability]" Gilman E.F. 1996. Horticopia-Trees, shrubs and groundcovers. Desops, Ltd. ---------- "A publication from Virginia on firewise landscaping techniques gave Chinaberrytree a low flammability rating [3]; however, no details were provided on how this determination was made." https://www.fs.fed.us/database/feis/plants/tree/melaze/all.html#3
Relative is flammable (Does a plant in the	No	

same genus meet the Reported Flammable criteria?)		

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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