Fire risk report for *Paspalum virgatum*

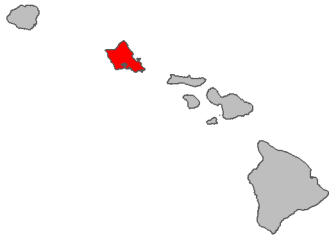
Full Species Name
Paspalum virgatum L.

Family: Poaceae

Common names:
sword grass

Synonyms:

Known occurrences (as of 2020)



Year first documented as naturalized in Hawai'i: 2003

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

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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 **0.31**.

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	Fire-prone
Fire promoting plant in its native range	No
Fire promoting plant in its introduced range*	No
Regenerates after fire	No Data
Promoted by fire	No
Reported flammable*	No Data
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?)	Fire-prone	"The absence of correlations of Paspalum virgatum with any environmental variable or with the other target species can be interpreted as a sign of generalist behavior. As this study expected, it was wide spread but with low abundances in the study regions. However, opposite the results of Ospina (2005), P. virgatum was not seen in riparian environments. This species is perennial, robust, caespitose and densely clumped and is consumed by the cattle only at the earlier stages of its life cycle. " https://ntnuopen.ntnu.no/ntnu-xmlui/bitstream/handle/11250/245173/608831_FULLTEXT01.pdf?sequence=1 Morales, J. (2012). Patterns of Distribution of Paspalum species along environmental gradients landscapes in the Nicaraguan Dry Tropical Forest (Master's thesis, Institutt for biologi). --- "the vegetation of the selected sites was burned annually during the dry season .... [later lists a community dominated by P. virgatum]" https://doi.org/10.1046/j.1466-822x.1998.00309.x SAN JOSE, J. J., MONTES, R., & MAZORRA, M. (1998). The nature of savanna heterogeneity in the Orinoco Basin. Global Ecology and Biogeography, 7(6), 441–455. --- "Soil is not the only factor that determines vegetation-types; wildfire is a major disturbance agent that maintains an open canopy in the savanna. Fire maintains a strong influence on vegetation dynamics in the Mountain Pine Ridge in Belize (Kellman and Meave, 1997), and although its effects have not been studied at MBWS, fire is indeed frequent and occasionally intense (Matthew Miller, pers. comm.). [later lists P. virgatum as present in the savanah]" Laughlin, D. C. (2002). Flora of the pine savanna at Monkey Bay Wildlife Sanctuary, Belize. Caribbean Journal of Science, 38(1/2), 151-155.
Fire promoting plant in its native range (Does the species act as a major fuel source,	No	"[rare in areas after burns]" Scott, G. A. (1977). The role of fire in the creation and maintenance of savanna in the Montana of Peru. Journal of Biogeography, 143-167.

increase fire severity, frequency, or modify fuel bed characteristics within its native range?)		
Fire promoting plant in its introduced range (Same as Fire Promoting Native but within the species introduced range)	No	not really invasive in many spots, so not much expectation for data
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)	No Data	"Paspalum virgatum seed was buried at 4 depths in soil at Central Farm, Belize, and subgroups were unearthed at annual intervals over a period of 3 years. The seed lost viability rapidly, indicating that the extensive buried viable seed banks of this species that have been found are maintained by constant seed input rather than prolonged viability. Consequently, the eradication of this species from agricultural soil should not be a very lengthy task. An exptl treatment. with fire, with seed of this species, it produced an almost complete destruction of the seed that remained on the surface of the soil but it only produced partial destruction of the seed buried at 1 cm. Of the surface. (RA-CIAT)." # that other sources list this as occurring in ecosystems where fire occurs regularly so it likely regenerates from the roots rather than seed. http://www.sidalc.net/cgi-bin/wxis.exe/?IsisScript=catalco.xis&method=post&formato=2&cantidad=1&expresion=mfn=028583 Kellman, M. (1980). Longevity and susceptibility to fire of Paspalum virgatum L. seed. Tropical Agriculture (Trinidad y Tobago)..(Oct, 57(4), 301-304.
Promoted by fire (Does the plant increase in abundance after a fire?)	No	
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?)	Yes	"Savanna fuel samples consisted of separate sets of Trachypogon plumosus (Humb. & Bonpl. ex. Willd.) and a Paspalum species, two grasses that were especially abundant at the study site [study site described as frequently burning]" Biddulph, J., & Kellman, M. (1998). Fuels and fire at savanna-gallery forest boundaries in southeastern Venezuela. Journal of Tropical Ecology, 445-461.

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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