


Fire risk report for *Dichanthium annulatum*

Full Species Name <i>Dichanthium annulatum</i> (Forssk.) Stapf
Family: Poaceae
Common names: Angleton grass
Synonyms:
Known occurrences (as of 2020) 
Year first documented as naturalized in Hawai'i: 1940
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 **0.72**.

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	Yes
Fire promoting plant in its introduced range*	No
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?)	Fire-prone	"The tropical grassland ecosystem is semi-natural, maintained by grazing, scraping and burning [lists <i>D. annulatum</i> as occurring]" https://link.springer.com/content/pdf/10.1556/ComEc.6.2005.2.2.pdf Srivastava, R., & Singh, K. P. (2005). Species diversity in dryland and irrigated agroecosystems and marginal grassland ecosystem in dry tropics. <i>Community Ecology</i> , 6(2), 131-141.
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?)	Yes	"The grassland stand of 50 x 25 m size was dominated by <i>Dichanthium annulatum</i> ... [describe it as burning easily]" #if <i>D. annulatum</i> is dominant, it must be flammable for the site to burn https://insa.nic.in/writereaddata/UpLoadedFiles/PINSA/Vol43B_1977_6_Art03.pdf PANDEY, A. (1977). NITROGEN (C/N) RATIO OF SOIL IN A <i>DICHANTHIUM ANNULATUM</i> . In <i>Proc. Indian natn. Sci. Acad</i> (Vol. 43, No. 213-218 Part B).
Fire promoting plant in its introduced range (Same as Fire Promoting Native but within the species introduced range)	No	#likely, but no data
Regenerates after fire (Does the plant regrow after fire by any means? This includes resprouters, reseeder, and recruiters which dispersed into the area within approximately one year post fire)	Yes	"Results indicate that summer burning can produce higher mortality rates in Kleberg bluestem than both winter burning and control treatments. However, both burning treatments increased seedling recruitment over control treatments. Furthermore, burning in either summer or winter did not affect individual plant production. These results suggest neither summer nor winter burning is effective for control of Kleberg bluestem as a single treatment, although summer burning is a better choice than winter burning." Toomey, A. E. (2015). Effects of seasonal prescribed burning on Kleberg bluestem (<i>Dichanthium annulatum</i>) in south Texas (Doctoral dissertation, Texas A&M University-Kingsville). https://search.proquest.com/openview/a0dc5e9db3a83bdb5f38f50c9b4b018/1?pq-

		<p>origsite=gscholar&cbl=18750&diss=y&casa_token=EqKqPS4IG2wAAAAA:9xKBxdVsyt5gLZnfB7BFVTi47smTMaXoBkSe8JaG8i1wZwXtHzEW5inSrZqR_Qqk6BSPswtMYyM</p> <p>-----</p> <p>"Early successional communities of the evacuated lands viz., <i>Dichanthium annulatum</i>-<i>Dimeria ornithopoda</i>, <i>Dichanthium annulatum</i>-<i>Themeda triandra</i> and <i>Dichanthium annulatum</i>-<i>Heteropogon contortus</i> communities have been changed into <i>Dimeria ornithopoda</i>-<i>Panicum montanum</i>, <i>Heteropogon contortus</i>-<i>Dimeria ornithopoda</i> and <i>Themeda triandra</i>-<i>Bothriochloa odorata</i> community types have shown the influence of grazing and fire on community structure and tend to develop middle successional stages. These grasslands were subjected to low grazing pressure and repeated annual fire which developed into fire resistant community types consisting of less palatable and fire resistant grass species"</p> <p>https://uknowledge.uky.edu/cgi/viewcontent.cgi?article=1882&context=igc</p> <p>Pandey, R. K. (2020). Grassland management in wildlife protected areas (PA's) in India.</p>
Promoted by fire (Does the plant increase in abundance after a fire?)	Yes	<p>"Burning was done in two cycles (annual and biennial) and in two seasons of the year, i.e. winter and summer. Considerable beneficial effect on plant population was observed in <i>B. intermedia</i>, <i>D. annulatum</i> and <i>H. contortus</i>."</p> <p>#full text of this article was not accessible</p> <p>https://www.cabdirect.org/cabdirect/abstract/20023061857</p> <p>Gupta, J. N., & Trivedi, B. K. (2001). Impact of fire on rangeland species. <i>Range Management and Agroforestry</i>, 22(2), 237-240.</p> <p>-----</p> <p>"Working in a <i>Dichanthium annulatum</i> dominated grasslands, Pandey (1974a) found an increase in the live biomass of grasses and forbs as a result of burning."</p> <p>http://www.ecosk.org/board/Pds/Board/pub_old/08_PaulsamySManianS%EA%B8%B8%EB%B4%89%EC%84%AD_FireAnd.pdf</p> <p>Paulsamy, S., Manian, S., & Kil, B. S. (2005). Fire and Rangeland's Management in India. <i>The Korean Journal of Ecology</i>, 28(1), 55-61.</p>
Reported flammable (Is the species described as being flammable,	High	<p>"The grassland stand of 50 x 25 m size was dominated by <i>Dichanthium annulatum</i>... [describe it as burning easily]"</p>

being a major wildfire fuel, or high fire risk?)		#if D. annulatum is dominant, it must be flammable for the site to burn https://insa.nic.in/writereaddata/UpLoadedFiles/PINSA/Vol43B_1977_6_Art03.pdf PANDEY, A. (1977). NITROGEN (C/N) RATIO OF SOIL IN A DICHANTHIUM ANNULATUM. In Proc. Indian natn. Sci. Acad (Vol. 43, No. 213-218 Part B).
Relative is flammable (Does a plant in the same genus meet the Reported Flammable criteria?)	Yes	"Silky Blue-grass is regarded as a species that produces foliage of flammability." http://www.vicveg.net.au/sysReportRender.aspx?RepName=vvPlantNote&RepFormat=HTML4.0&RepPage=0&RepExport=N&LinkTarget=_parent&paramCMA=0&paramSpeciesNo=1032&paramSiteURL=http://www.vicveg.net.au/

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 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.

