Taxon: Bambusa vulgaris **Family:** Poaceae

Common Name(s): common bamboo
golden bamboo

Synonym(s): Bambusa vulgaris var. vittata Riviere

Assessor: Chuck Chimera **Status:** Assessor Approved **End Date:** 2 Feb 2017

WRA Score: 8.0 **Designation:** H(HPWRA) **Rating:** High Risk

Keywords: Clumping Bamboo, Environmental Weed, Monoculture-Forming, Non-Seeding, Water-Dispersed

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	y
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	n
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	y
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	y
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals	y=1, n=-1	n
405	Toxic to animals	y=1, n=0	y
406	Host for recognized pests and pathogens	y=1, n=0	n
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
408	Creates a fire hazard in natural ecosystems		
409	Is a shade tolerant plant at some stage of its life cycle		

Qsn #	Question	Answer Option	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	y
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	y
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat		
602	Produces viable seed	y=1, n=-1	n
603	Hybridizes naturally		
604	Self-compatible or apomictic		
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	>3
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	n
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
704	Propagules adapted to wind dispersal		
705	Propagules water dispersed	y=1, n=-1	y
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	n
801	Prolific seed production (>1000/m2)	y=1, n=-1	n
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	n
803	Well controlled by herbicides		
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	y
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

Supporting Data:

Qsn #	Question	Answer
101	**Is the species highly domesticated?**	**n**
	Source(s)	**Notes**
	Brink, M., 2008. Bambusa vulgaris Schrad. ex J.C.Wendl. In: Louppe, D., Oteng-Amoako, A.A. & Brink, M. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands	"Bambusa vulgaris originated in the Old World, probably in tropical Asia. It is only known from cultivation, although escaped and naturalized populations exist. Common bamboo is the most widely grown bamboo throughout the tropics and subtropics. In tropical Africa it is widely grown and also occurs subspontaneously. " [Long cultivated, but no evidence of domestication]

102	Has the species become naturalized where grown?	
	Source(s)	**Notes**
	WRA Specialist. 2017. Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	**Notes**
	WRA Specialist. 2017. Personal Communication	NA

201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	High
	Source(s)	**Notes**
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"B. vulgaris originated in the Old World, probably in tropical Asia. However, it is very widely cultivated throughout the tropics and subtropics"

202	Quality of climate match data	High
	Source(s)	**Notes**
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	

203	Broad climate suitability (environmental versatility)	y
	Source(s)	**Notes**
	Sankaran, K.V. & Suresh, T.A. 2013. Invasive alien plants in the forests of Asia and the Pacific. FAO, Bangkok	"Bambusa vulgaris is an ornamental bamboo widespread in the tropics and subtropics. It tolerates a wide range of climatic conditions and thrives under varied soil conditions. B. vulgaris grows as monospecific stands along riverbanks, roadsides and open ground."

Qsn #	Question	Answer
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"Climatic amplitude (estimates) - Altitude range: 0 - 1200 m - Mean annual rainfall: > 700 mm - Rainfall regime: summer; uniform - Dry season duration: 0 - 8 months - Mean annual temperature: 15 - 40ºC - Mean maximum temperature of hottest month: 25 - 50ºC - Mean minimum temperature of coldest month: 10 - 30ºC - Absolute minimum temperature: > -3ºC" [Approximate limits north to south: 20°N to 19°S & elevation range exceeds 1000 m]

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	**Notes**
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"Bambusa vulgaris is the most commonly encountered bamboo in cultivation in SE Asia but is rarely found in natural forest (although possibly natural, or escaped, naturalized populations exist). It is grown pantropically, and is the only Asian species that is common in the New World." ... "B. vulgaris originated in the Old World, probably in tropical Asia. It is the most widely cultivated bamboo throughout the tropics and subtropics, but is also found spontaneously or naturalized on river banks."

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	**Notes**
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"Bambusa vulgaris is the most commonly encountered bamboo in cultivation in SE Asia but is rarely found in natural forest (although possibly natural, or escaped, naturalized populations exist). It is grown pantropically, and is the only Asian species that is common in the New World."

301	Naturalized beyond native range	y
	Source(s)	**Notes**
	Rashford, J. H. (1995). The past and present uses of bamboo in Jamaica. Economic Botany, 49(4), 395-405	'...a giant naturalized weed restricted primarily to river courses, ponds, water holes, roadways, inaccessible hillsides, pastures...'
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 2 Feb 2017]	"Naturalized: Northern America South-Central U.S.A.: United States - Texas Southeastern U.S.A.: United States - Florida Southern America Brazil: Brazil Caribbean: Cuba; Hispaniola; Jamaica Central America: Costa Rica"
	Imada, C. 2012. Hawaiian Native and Naturalized Vascular Plants Checklist (December 2012 update). Bishop Musem Technical Report 60. Bishop Museum, Honolulu, HI	No evidence

Qsn #	Question	Answer
	Wagner, W.L., Herbst, D.R.& Lorence, D.H. 2017. Flora of the Hawaiian Islands. Smithsonian Institution, Washington, D.C. http://botany.si.edu/. [Accessed 2 Feb 2017]	No evidence to date

302	Garden/amenity/disturbance weed	n
	Source(s)	**Notes**
	CABI, 2017. Invasive Species Compendium. Wallingford , UK: CAB International. www.cabi.org/isc	No evidence

303	Agricultural/forestry/horticultural weed	n
	Source(s)	**Notes**
	CABI, 2017. Invasive Species Compendium. Wallingford , UK: CAB International. www.cabi.org/isc	No evidence

304	Environmental weed	y
	Source(s)	**Notes**
	CABI, 2017. Invasive Species Compendium. Wallingford , UK: CAB International. www.cabi.org/isc	"B. vulgaris grows forming extensive monospecific stands which outcompete native vegetation by shading native plants and monopolizing resources (Blundell et al., 2003). This species also represents a serious environmental concern because it has the potential to invade native forests moving along riparian zones (Okutomi et al. 1996). It also disrupts the successional process in disturbed areas, secondary forests, and forest edges in coastal and riparian forests (Blundell et al., 2003). In many Caribbean islands (i.e., Jamaica, Tobago, and Puerto Rico), B. vulgaris has colonized many streams that intersect roads and formed monocultures in some riparian areas (Blundell et al., 2003; Kairo et al., 2003). A study performed in riparian areas of the Luquillo Mountains (Puerto Rico), showed that introduced bamboos may affect native stream macro-invertebrates through alteration of food resources and habitat typically provided by leaf inputs from native, mixed-species riparian forests. This study showed that alien bamboo leaf fall exceeds that of native mixed forests, and where bamboo occurs in riparian zones, bamboo leaves undergo rapid leaching of elements during aquatic decay (O'Connor et al., 2000)."
	Motooka, P., Castro, L., Nelson, D., Nagai, G. & Ching,L. 2003. Weeds of Hawaii's Pastures and Natural Areas: An Identification and Management Guide. CTAHR, UH Manoa, Honolulu, HI	"Environmental impact: Does not spread aggressively but could be a problem in old home sites in forests."

305	Congeneric weed	y
	Source(s)	**Notes**

Qsn #	Question	Answer
	CABI, 2017. Invasive Species Compendium. Wallingford , UK: CAB International. www.cabi.org/isc	"B. bambos has been widely cultivated across tropical and temperate regions of the world (PROTA, 2015; USDA-ARS, 2015). It is a multipurpose bamboo with a range of uses ranging from edible shoots (vegetable), leaves (forage) and seeds (famine food) to valuable culms (wood and construction material). As its culms and branches root very readily, it often naturalizes forming monospecific stands along river banks, roadsides and disturbed sites. It has the potential to invade relative unaltered forests moving along streams and undisturbed clumps are almost impenetrable because of the interlacing thorny branches (Duriyaprapan and Jansen 1995; Ohrnberger, 1999). At present, it has been listed as invasive in Cuba (Oviedo Prieto et al., 2012)."

401	Produces spines, thorns or burrs	n
	Source(s)	**Notes**
	Wu, Z.Y., Raven, P.H. & Hong, D.Y. (eds.). 2006. Flora of China. Vol. 22 (Poaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	[No evidence] "Clumps rather open. Culms 8–15 m, 5–9 cm in diam., basally straight or flexuose, apically drooping; internodes deep green, 20–30 cm, initially thinly white powdery, stiffly pale brown strigose; wall slightly thick; nodes slightly prominent, basal several with aerial roots and rings of grayish white silky hairs below and above sheath scar; usually branching from lower nodes. Branches several to many, clustered, central dominant. Culm sheaths deciduous, ribbed-striate when dry, densely stiffly deciduously dark brown hairy, apex arched below blade, concave below auricles; auricles conspicuous, ascending, nearly equal in shape and size, oblong or reniform, 8–10 mm; oral setae curved, fine; ligule 3–4 mm, serrate, very shortly white ciliolate; blade deciduous, erect or deflexed, broadly triangular to triangular, base slightly rounded, ca. 1/2 width of sheath apex, abaxially sparsely stiffly dull brown hairy, adaxially densely stiffly dull brown hairy between veins, apex involute, sharply apiculate. Leaf blade narrowly lanceolate, 10–30 × 1.3– 2.5 cm, both surfaces glabrous."

402	Allelopathic	
	Source(s)	**Notes**

Qsn #	Question	Answer
	Alencar, S. R., Silva, M. A. P., Figueiredo, M. F., Santos, M. A. F., Generino, M. E. M., Torquato, I. H. S., & Crispim, M. K. M. (2015). Biological Activity of Bambusa vulgaris Schrad. ex JC Wendl.(Poaceae). Journal of Agricultural Science, 7(6), 150-159	[Possibly Yes] "This study aims to evaluate the allelopathic activity of Bambusa vulgaris Schrad. ex J.C. Wendl., invasive species in an area of Cerrado in the Chapada do Araripe in Ceará. The treatments consisted of the aqueous extract in concentrations of 25, 50, 75 and 100% and a Control (distilled water), with five replicates containing 20 seeds each. The tests were carried out in the laboratory and in a greenhouse, using corn and beans as the test seeds. The parameters analyzed were number of germinated seeds, measurement of caulicle and radical length, occurrence of radicle necrosis and germination speed index (GSI). The results obtained from the laboratory bioassays on corn seeds indicate that the extract affected development of the seedlings, reducing caulicle growth and increasing radicle length, in addition to causing radicle necrosis. Regarding the bean seeds, there was a delay in the GSI, reduced caulicle growth and radicle necrosis. In the bioassay conducted in the greenhouse, for the corn seeds the extract inhibited germination and both caulicle and radicle growth, as well as delaying the GSI. When tested on the beans, the extract provoked reduction in the number of germinated seeds at the higher concentrations, delayed the GSI, reduced the radicle size and caused radicle necrosis. The allelopathic effects observed in the greenhouse were more significant, suggesting that environmental factors in conjunction with the action of the allelochemicals interfered more actively with the seed germination and seedling development of the receptor species."

403	Parasitic	n
	Source(s)	**Notes**
	Francis, J.K. 1993. Bambusa vulgaris Schrad ex Wendl. SO-ITF-SM-65. USDA Forest Service International Institute of Tropical Forestry, Rio Piedras, PR	"Bambusa vulgaris Schrad ex Wendl., known as common bamboo or bambu (Spanish), is a tall, thornless, clump-forming bamboo" [Poaceae. No evidence]

404	Unpalatable to grazing animals	n
	Source(s)	**Notes**
	Ikhimioya, I. 2008. Acceptability of selected common shrubs/tree leaves in Nigeria by West African dwarf goats. Livestock Research for Rural Development 20(6): lrrd.cipav.org.co/lrrd20/6/ikhi20090.htm	"Bambusa vulgaris appeared to be most preferred by the goats compared to the least preference value recorded for Chromolaena odorata."
	Motooka, P., Castro, L., Nelson, D., Nagai, G. & Ching,L. 2003. Weeds of Hawaii's Pastures and Natural Areas: An Identification and Management Guide. CTAHR, UH Manoa, Honolulu, HI	"Livestock will graze shoots but cannot bring down large plants."
	Bhandari, M. S., Kaushal, R., Banik, R. L., & Tewari, S. K. (2015). Genetic evaluation of nutritional and fodder quality of different bamboo species. Indian Forester, 141 (3), 265-274	"The leaves of B. vulgaris are very rich in nitrogenous material; they are a valuable feed, which cattle and horses eat with zest, while B. vulgaris and B. ventricosa are excellent sources of vitamin A."

405	Toxic to animals	y

Qsn #	Question	Answer
	Source(s)	**Notes**
	Halvorson, J. J., Cassida, K. A., Turner, K. E., & Belesky, D. P (2011). Nutritive value of bamboo as browse for livestock. Renewable Agriculture and Food Systems, 26(02), 161-170	"Some bamboo species (e.g. Bambusa vulgaris from Brazil) have been reported to contain unidentified compounds toxic to horses"
	Barbosa, J. D., de Oliveira, C. M. C., Duarte, M. D., Riet-Correa, G., Peixoto, P. V., & Tokarnia, C. H. (2006). Poisoning of horses by bamboo, Bambusa vulgaris. Journal of Equine Veterinary Science, 26(9), 393-398	"The clinical and pathological aspects of a neurological disease observed in 16 horses in Pará, Amazonia, Brazil, are presented. The symptoms were mainly motor incoordination, paresis of the tongue, somnolence, difficulties in apprehension, chewing and swallowing of food, as well as instability and standing with abducted members. The clinical course was subacute or chronic and in most cases was not fatal. Postmortem examination performed in one already very sick, euthanized animal, did not show significant macroscopic lesions; histopathological examination revealed slight edema and degenerative alterations of a few axons, mainly in the medulla oblongata. In all pastures where horses were affected, plenty of bamboo had been eaten, probably because of scarcity of pasture. By feeding large amounts of fresh bamboo leaves of this region, in different growing stages, to three horses (horse 1, 47 g/kg/d for 30 days; horse 2, 10 g/kg/d for 60 days; horse 3, 18 g/kg on the first day, and 31 g/kg/d for 6 more days)—the animals ate the leaves unassisted—it was possible to reproduce nervous symptoms essentially identical to those observed in the natural disease 24 to 72 hours after the first feeding of the plant. In spite of continuous administration of the plant, intensity of the clinical signs did not increase. Based on field observations and comparison of the clinical and pathological pictures seen in the natural and experimental disease, the described illness can be concluded to be caused by the ingestion of large amounts of the leaves of Bambusa vulgaris f. vulgaris."

406	Host for recognized pests and pathogens	n
	Source(s)	**Notes**
	Dransfield, S. & Widjaja, E.A., 1995. Bambusa vulgaris Schrader ex Wendland[Internet] Record from Proseabase. Dransfield, S. & Widjaja, E.A. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 2 Feb 2017]	"Diseases and pests No serious diseases in Bambusa vulgaris have been reported in South-East Asia. The most serious disease of Bambusa vulgaris in Bangladesh is bamboo blight, caused by Sarocladium oryzae, killing affected clumps within 3—4 years. Harvested culms are very vulnerable to attack of powder-post beetles (Dinoderus spp.). Termite damage can be serious, especially of harvested culms in contact with ground."
	Brink, M., 2008. Bambusa vulgaris Schrad. ex J.C.Wendl. In: Louppe, D., Oteng-Amoako, A.A. & Brink, M. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands	"Diseases of Bambusa vulgaris include leaf blight (Cercospora sp.), basal culm rot (Fusarium sp.), culm sheath rot (Glomerella cingulata), leaf rust (Kweilingia divina, synonym: Dasturella divina) and leaf spots (Dactylaria sp. and Glomerella cingulata). A serious disease in Bangladesh is bamboo blight caused by Sarocladium oryzae, killing affected clumps within 3–4 years. Bamboo blight especially occurs on sites with impeded drainage. It can be controlled by cultural practices such as removal of infected stems and burning of debris, and by fungicides. "

407	Causes allergies or is otherwise toxic to humans	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	CABI, 2017. Invasive Species Compendium. Wallingford , UK: CAB International. www.cabi.org/isc	[No evidence] "The very young shoots are edible and sold as a vegetable mainly in Asia. This species is also used in traditional Asian and African medicine where young shoots are boiled and used to treat hepatitis and measles."
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[No evidence] "young shoots edible, young culms used for the making of boards, sometimes used as abortifacient, a cold decoction of the roots used for kidney troubles, leaves used as sudorific and febrifuge agents, sap from the young shoot recommended to treat fever and hematuria, tabasheer from culm-internodes used to treat infantile epilepsy, in China roots, shoots, bark and leaves are used, bark astringent and emmenagogue"

408	Creates a fire hazard in natural ecosystems	
	Source(s)	**Notes**
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"Along rivers and lakes it grows in almost permanently humid conditions, but it also grows in areas with more severe, dry conditions where the plants become completely defoliated." [Could possibly be a hazard after a large clump dies, but no reports on this]

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	**Notes**
	Francis, J.K. 1993. Bambusa vulgaris Schrad ex Wendl. SO-ITF-SM-65. USDA Forest Service International Institute of Tropical Forestry, Rio Piedras, PR	"The shade tolerance of common bamboo seedlings is unknown. New clumps from cuttings can grow in light shade. Clumps probably need overhead sunlight in order to fully develop."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	**Notes**
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"B. vulgaris thrives under a wide range of moisture and soil conditions. In Peninsular Malaysia it even grows well on degraded soils containing tin."
	Francis, J.K. 1993. Bambusa vulgaris Schrad ex Wendl. SO-ITF-SM-65. USDA Forest Service International Institute of Tropical Forestry, Rio Piedras, PR	"Common bamboo grows best in continuously moist, well-drained soils, but can withstand short-term flooding (14) or water tables within 30 cm of the surface (22). The species will not survive prolonged flooding. In Puerto Rico, common bamboo grows in soils where the pH ranges from about 4.5 to 7.5 (author, personal observation). Although common bamboo is one or the more salt-tolerant bamboos, it will not withstand free salt in the soil (2). Common bamboo will grow on all soil textures if sufficient moisture is present. Clay or heavy loam soils are more suited to common bamboo than sandy soils because they retain more moisture during dry periods and require less irrigation during the establishment phase (1)."

411	Climbing or smothering growth habit	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"Open clumping, sympodial bamboo. Culm erect, sinuous or slightly zig-zag, 10-20 m tall, 4-10 cm in diameter, wall 7-15 mm thick, glossy green, yellow, or yellow with green stripes; internodes 20 45 cm long, with appressed dark hairs and white waxy when young, becoming glabrous, smooth and shiny with age; nodes oblique, slightly swollen, basal ones covered with aerial roots."

412	Forms dense thickets	y
	Source(s)	**Notes**
	Francis, J.K. 1993. Bambusa vulgaris Schrad ex Wendl. SO-ITF-SM-65. USDA Forest Service International Institute of Tropical Forestry, Rio Piedras, PR	"After 3 or 4 years, the clumps are dense enough to shade out weeds. Common bamboo is so competitive that hardwoods or vines are rarely able to grow up through the clumps (author, personal observation)."
	CABI, 2017. Invasive Species Compendium. Wallingford , UK: CAB International. www.cabi.org/isc	"In many Caribbean islands (i.e., Jamaica, Tobago, and Puerto Rico), B. vulgaris has colonized many streams that intersect roads and formed monocultures in some riparian areas (Blundell et al., 2003; Kairo et al., 2003)."
	Sankaran, K.V. & Suresh, T.A. 2013. Invasive alien plants in the forests of Asia and the Pacific. FAO, Bangkok	"Threat and damage: It can exclude nearby plants by forming monospecific stands."

501	Aquatic	n
	Source(s)	**Notes**
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	[Terrestrial] "B. vulgaris can be found growing pantropically from low elevations up to 1200 m altitude. It grows best, however, at lower altitudes; above 1000 m, culms become smaller in length and diameter. Along rivers and lakes it grows in almost permanently humid conditions, but it also grows in areas with more severe, dry conditions where the plants become completely defoliated. It is frost hardy to -3°C. In South-East Asia the green-culm plants are widely naturalized on river banks, road sides, wastelands and open ground."

502	Grass	y
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 2 Feb 2017]	Family: Poaceae (alt.Gramineae) Subfamily: Bambusoideae Subtribe: Bambusinae

503	Nitrogen fixing woody plant	n
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 2 Feb 2017]	Family: Poaceae (alt.Gramineae) Subfamily: Bambusoideae Subtribe: Bambusinae

Qsn #	Question	Answer
504	**Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)**	**n**
	Source(s)	**Notes**
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"Open clumping, sympodial bamboo. Culm erect, sinuous or slightly zig-zag, 10-20 m tall, 4-10 cm in diameter, wall 7-15 mm thick, glossy green, yellow, or yellow with green stripes; internodes 20-45 cm long, with appressed dark hairs and white waxy when young, becoming glabrous, smooth and shiny with age; nodes oblique, slightly swollen, basal ones covered with aerial roots."

601	**Evidence of substantial reproductive failure in native habitat**	
	Source(s)	**Notes**
	Koshy, K. C., & Pushpangadan, P. (1997). Bambusa vulgaris blooms, a leap towards extinction?. Current Science, 72 (9), 622-624	"The incidence of flowering in this species is very rarely reported. … During each occurrence of flowering only few clumps are involved and no report of gregarious flowering exisits. Unusually flowering was not followed by fruit setting in any recorded history and eventually clumps involved perished." [This information comes from India (not native range)]
	Koshy, K. C., & Jee, G. (2001). Studies on the absence of seed set in Bambusa vulgaris. Current Science 81(4), 375-378	"The infrequent flowering and lack of sexual reproduction (seed set) in Bambusa vulgaris1, one of the most commonly cultivated bamboos belonging to the subfamily Bambusoideae of Poaceae, have been a matter of curiosity among bamboo specialists2–7. As many as 20 incidences of flowering of this species were reported from 10 countries during the past one and a half centuries8. Strangely enough, no fruit set was reported from anywhere."

602	**Produces viable seed**	**n**
	Source(s)	**Notes**
	Koshy, K. C., & Pushpangadan, P. (1997). Bambusa vulgaris blooms, a leap towards extinction?. Current Science, 72 (9), 622-624	"Except a doubtful report by Lantican et al seeds of B. vulgaris remain to be botanically known."
	Brink, M., 2008. Bambusa vulgaris Schrad. ex J.C.Wendl. In: Louppe, D., Oteng-Amoako, A.A. & Brink, M. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands	"Fruit not developing."
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"Infrequency of flowering, failure to produce seed and divert resources away from culm production, and recovery of clumps after flowering are other assets, and may be a result of repeated selection and cloning (Stapleton, 1990)."
	Francis, J.K. 1993. Bambusa vulgaris Schrad ex Wendl. SO-ITF-SM-65. USDA Forest Service International Institute of Tropical Forestry, Rio Piedras, PR	"No information is available on seed production except that it is rare and in many areas, absent (2). Seed dissemination is probably by gravity, water, birds, and rodents as is the case with other bamboos and grasses."

Qsn #	Question	Answer
	Koshy, K. C., & Jee, G. (2001). Studies on the absence of seed set in Bambusa vulgaris. Current Science 81(4), 375-378	"No seed set is reported in the common bamboo, Bambusa vulgaris, (Bambusoideae: Poaceae) so far. The causes for its sterility were studied through investigations on pollen fertility, viability, in vitro and in vivo germination and cytology. Very low pollen viability and high pollen sterility are due to meiotic irregularities. Although a small proportion of pollen grains germinated following manual pollination, pollen tubes were inhibited in the stigmatic papillae. Lack of seed set in this species seems to be the result of cumulative effect of a number of physical and physiological factors."

603	Hybridizes naturally	
	Source(s)	**Notes**
	WRA Specialist. 2017. Personal Communication	Unknown. Other Bambusa species have been artificially crossed

604	Self-compatible or apomictic	
	Source(s)	**Notes**
	Francis, J.K. 1993. Bambusa vulgaris Schrad ex Wendl. SO-ITF-SM-65. USDA Forest Service International Institute of Tropical Forestry, Rio Piedras, PR	"McClure (22) reported that occasional flowering clumps of common bamboo can be found across areas of its range at the beginning of the rainy season and that these flowers are self-sterile."
	Koshy, K. C., & Jee, G. (2001). Studies on the absence of seed set in Bambusa vulgaris. Current Science 81(4), 375-378	"The percentage of in vivo pollen germination though low, was very significant. In spite of germination, the pollen tube did not find its way into the style, to effect fertilization. This appears to be the result of self-incompatibility. Self-incompatibility can be confirmed only when pollen grains of a different clone are available for effective cross-pollination17"

605	Requires specialist pollinators	n
	Source(s)	**Notes**
	Koshy, K. C., Harikumar, D., & Narendran, T. C. (2001). Insect visits to some bamboos of the Western Ghats, India. Current Science, 81(7), 833-837	"Bee visits in six tropical Woody bamboos (Bambusoideae: Poaceae)—Bambusa bambos (native), Bambusa sp., B. vulgaris (both cultivated), Ochlandra ebracteata, 0. scriptoria, 0. travancorica (all endemic) were studied. The bees were predominantly of order Hymenoptera and belong to genera Apis, Halictus, Trigona, Braunsapis and Ceratina. In Ochlandra spp and B. vulgaris the bees visited the florets only at the male stage."
	Zomlefer, W.B. 1994. Guide to Flowering Plant Families. The University of North Carolina Press, Chapel Hill & London	"The reduced flowers are anemophilous, although pollen-gathering insects have been reported for some grass species" [Poaceae family description]

606	Reproduction by vegetative fragmentation	y
	Source(s)	**Notes**
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"B. vulgaris can be propagated by rhizome, culm and branch cuttings, by layering and by tissue culture. Rhizome cuttings (offsets) always give a good result when taken from 1- to 2-year-old culms, but damage the mother clump and are not convenient for large scale plantation."

Qsn #	Question	Answer
	Brink, M., 2008. Bambusa vulgaris Schrad. ex J.C.Wendl. In: Louppe, D., Oteng-Amoako, A.A. & Brink, M. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands	"Bambusa vulgaris clumps expand rapidly during the first 5–6 years (from 0.5 m diameter in the first year to 4.5 m in the 6th year) and slower thereafter (to 7 m diameter after 10 years). Young shoots grow rapidly. In 2 weeks they can develop into stems3–4 m tall, reaching 20 m in length in 3 months. Stems reach maximum diameters after 9 years."
	Francis, J.K. 1993. Bambusa vulgaris Schrad ex Wendl. SO-ITF-SM-65. USDA Forest Service International Institute of Tropical Forestry, Rio Piedras, PR	"The rooting ability of cuttings can be illustrated by whole stands of common bamboo in Jamaica that have arisen through the spontaneous rooting of green culms used for yam stakes (22)." ... "Rhizomes or pieces of live culms are sometimes transported in fill dirt and generate new clumps."

607	Minimum generative time (years)	>3
	Source(s)	**Notes**
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"Flowering is erratic and is reported to take place after some 150 years of vegetative growth, after which the clump dies."
	Koshy, K. C., & Pushpangadan, P. (1997). Bambusa vulgaris blooms, a leap towards extinction?. Current Science, 72 (9), 622-624	The flowering cycle is believed to be 80 (+ or - 8 years).

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	**Notes**
	Francis, J.K. 1993. Bambusa vulgaris Schrad ex Wendl. SO-ITF-SM-65. USDA Forest Service International Institute of Tropical Forestry, Rio Piedras, PR	"No information is available on seed production except that it is rare and in many areas, absent (2). Seed dissemination is probably by gravity, water, birds, and rodents as is the case with other bamboos and grasses." [Seeds rarely or never produced. Lack means of external attachment] "Rhizomes or pieces of live culms are sometimes transported in fill dirt and generate new clumps."

702	Propagules dispersed intentionally by people	y
	Source(s)	**Notes**
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"It is the most widely cultivated bamboo throughout the tropics and subtropics, but is also found spontaneously or naturalized on river banks."

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	**Notes**
	Francis, J.K. 1993. Bambusa vulgaris Schrad ex Wendl. SO-ITF-SM-65. USDA Forest Service International Institute of Tropical Forestry, Rio Piedras, PR	"No information is available on seed production except that it is rare and in many areas, absent (2). Seed dissemination is probably by gravity, water, birds, and rodents as is the case with other bamboos and grasses." [Lack of seed production would limit or prevent contamination]

704	Propagules adapted to wind dispersal	

Qsn #	Question	Answer
	Source(s)	**Notes**
	Francis, J.K. 1993. Bambusa vulgaris Schrad ex Wendl. SO-ITF-SM-65. USDA Forest Service International Institute of Tropical Forestry, Rio Piedras, PR	[Seeds might be wind-dispersed, if produced. Rare or absent in cultivation] "Common bamboo rarely flowers. In fact, flowering has not been observed in recorded history in many parts of the world (including Puerto Rico)" ... "No information is available on seed production except that it is rare and in many areas, absent (2). Seed dissemination is probably by gravity, water, birds, and rodents as is the case with other bamboos and grasses."

705	Propagules water dispersed	y
	Source(s)	**Notes**
	Francis, J.K. 1993. Bambusa vulgaris Schrad ex Wendl. SO-ITF-SM-65. USDA Forest Service International Institute of Tropical Forestry, Rio Piedras, PR	"In Puerto Rico, natural regeneration occurs to some extent along streambanks when rhizomes and culms are washed downstream in floods and then deposited with sediment in overflow areas (author, personal observation)."

706	Propagules bird dispersed	n
	Source(s)	**Notes**
	Francis, J.K. 1993. Bambusa vulgaris Schrad ex Wendl. SO-ITF-SM-65. USDA Forest Service International Institute of Tropical Forestry, Rio Piedras, PR	[Speculative, & probably irrelevant as seeds rarely or never produced] "No information is available on seed production except that it is rare and in many areas, absent (2). Seed dissemination is probably by gravity, water, birds, and rodents as is the case with other bamboos and grasses."

707	Propagules dispersed by other animals (externally)	n
	Source(s)	**Notes**
	Francis, J.K. 1993. Bambusa vulgaris Schrad ex Wendl. SO-ITF-SM-65. USDA Forest Service International Institute of Tropical Forestry, Rio Piedras, PR	[Speculative, & probably irrelevant as seeds rarely or never produced] "No information is available on seed production except that it is rare and in many areas, absent (2). Seed dissemination is probably by gravity, water, birds, and rodents as is the case with other bamboos and grasses."

708	Propagules survive passage through the gut	n
	Source(s)	**Notes**
	Francis, J.K. 1993. Bambusa vulgaris Schrad ex Wendl. SO-ITF-SM-65. USDA Forest Service International Institute of Tropical Forestry, Rio Piedras, PR	[No evidence. Seeds rarely, or never, produced] "No information is available on seed production except that it is rare and in many areas, absent (2). Seed dissemination is probably by gravity, water, birds, and rodents as is the case with other bamboos and grasses."

801	Prolific seed production (>1000/m2)	n
	Source(s)	**Notes**
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"Flowering in B. vulgaris is not common. When a culm flowers, it produces a large number of flowers but no fruit, and eventually the culm dies, but the clumps usually survive and return to fully vegetative growth within a few years."

Qsn #	Question	Answer
	Koshy, K. C., & Jee, G. (2001). Studies on the absence of seed set in Bambusa vulgaris. Current Science 81(4), 375-378	"No seed set is reported in the common bamboo, Bambusa vulgaris , (Bambusoideae: Poaceae) so far. The causes for its sterility were studied through investigations on pollen fertility, viability, in vitro and in vivo germination and cytology. Very low pollen viability and high pollen sterility are due to meiotic irregularities. Although a small proportion of pollen grains germinated following manual pollination, pollen tubes were inhibited in the stigmatic papillae. Lack of seed set in this species seems to be the result of cumulative effect of a number of physical and physiological factors."

802	Evidence that a persistent propagule bank is formed (>1 yr)	n
	Source(s)	**Notes**
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	[No seeds produced. No effective seedbank] "Flowering in B. vulgaris is not common. When a culm flowers, it produces a large number of flowers but no fruit, and eventually the culm dies, but the clumps usually survive and return to fully vegetative growth within a few years."

803	Well controlled by herbicides	
	Source(s)	**Notes**
	Pacific Islands Ecosystems at Risk (PIER). 2011. Bambusa spp. http://www.hear.org/Pier/species/bambusa_spp.htm. [Accessed 2 Feb 2017]	"Chemical: Remove tops and spray regrowth with Glyphosate® or Amitrole® 2%. Velpar® can be used but is persistent in the soil. However, it has been reported that glyphosate does not adequately translocate to the rhizomes (Dick Veitch, communication to Aliens list server)."
	Motooka, P., Castro, L., Nelson, D., Nagai, G. & Ching,L. 2003. Weeds of Hawaii's Pastures and Natural Areas: An Identification and Management Guide. CTAHR, UH Manoa, Honolulu, HI	"Management: Difficult. Best to cut down and spray the regrowth. In forests and other non-cropland, imazapyr or glyphosate plus fluazifop are effective (J. DeFrank, Univ. Hawai'i)."
	Sankaran, K.V. & Suresh, T.A. 2013. Invasive alien plants in the forests of Asia and the Pacific. FAO, Bangkok	"Management: Digging the rhizomes out is the most common method used. Cutting at the top and spraying herbicides such as glyphosate and amitrole are effective. Biological control is unknown."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	Source(s)	**Notes**
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"Golden bamboo is used as an ornamental outdoors, or when pollarded, as a container plant indoors." [Can be pollarded]
	Dransfield, S. & Widjaja, E.A., 1995. Bambusa vulgaris Schrader ex Wendland[Internet] Record from Proseabase. Dransfield, S. & Widjaja, E.A. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 2 Feb 2017]	"Harvesting Being the most common village bamboo, culms of Bambusa vulgaris are harvested whenever needed. Normally, harvesting may start 3 years after planting. Full production is reached 6—8 years after planting. Selective cutting of culms 2-year-old or older is recommended. Young shoots should be harvested in the first week of their emergence."

Qsn #	Question	Answer
	Motooka, P., Castro, L., Nelson, D., Nagai, G. & Ching,L. 2003. Weeds of Hawaii's Pastures and Natural Areas: An Identification and Management Guide. CTAHR, UH Manoa, Honolulu, HI	"Management: Difficult. Best to cut down and spray the regrowth. In forests and other non-cropland, imazapyr or glyphosate plus fluazifop are effective (J. DeFrank, Univ. Hawai'i)." [Regrows without herbicide application]

805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	
	Source(s)	**Notes**
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	Unknown. No mention of pests in Hawaiian Islands

Summary of Risk Traits:

High Risk / Undesirable Traits
• Elevation range exceeds 1000 m, demonstrating environmental versatility
• Thrives in tropical climates
• Naturalized elsewhere (although no evidence from Hawaiian Islands)
• Regarded as an environmental weed elsewhere
• Potentially allelopathic
• Other Bambusa species have become invasive
• Toxic if eaten by horses
• Tolerates many soil types
• Forms dense, monospecific stands
• Reproduces vegetatively by rhizomes & fragments
• Water can move rhizome fragments
• Able to be pollarded & can resprout after cutting

Low Risk Traits
• Not naturalized in the Hawaiian Islands despite widespread cultivation
• Unarmed (no spines, thorns, or burrs)
• Palatable to animals (despite toxicity to horses)
• Ornamental
• Not known to produce seeds
• As a sympodial bamboo, spreads more slowly than monopodial (runner) bamboos
• Reaches maturity in 80+ years (and does not produce seeds)
• Lack of seed production limits long-distance dispersal
• Herbicides may provide effective control