

<b>Taxon:</b> <i>Digitaria eriantha Steud.</i>	<b>Family:</b> Poaceae
<b>Common Name(s):</b> common finger grass digit grass pangola grass woolly finger grass	<b>Synonym(s):</b> <i>Digitaria decumbens</i> Stent <i>Digitaria pentzii</i> Stent <i>Digitaria smutsii</i> Stent <i>Digitaria valida</i> Stent

<b>Assessor:</b> Chuck Chimera	<b>Status:</b> Assessor Approved	<b>End Date:</b> 9 Nov 2021
<b>WRA Score:</b> 7.0	<b>Designation:</b> H(HPWRA)	<b>Rating:</b> High Risk

**Keywords:** Naturalized Grass, Environmental Weed, Forage, Non-Seeding, Flammable

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	n
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
408	Creates a fire hazard in natural ecosystems	y=1, n=0	y

Qsn #	Question	Answer Option	Answer
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	n
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	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	n
603	Hybridizes naturally		
604	Self-compatible or apomictic	y=1, n=-1	n
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	1
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
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	y=1, n=-1	n
705	Propagules water dispersed		
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/m <sup>2</sup> )	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)	y=-1, n=1	y

**Supporting Data:**

Qsn #	Question	Answer
101	Is the species highly domesticated?	n
	Source(s)	Notes
	Cook, B.G., et al. (2020). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed ]	[Assessment of non-seeding genotype. Both seedless and seeding genotypes exist, each with the ability to spread and naturalize] "The extreme diversity within <i>D. eriantha</i> makes it difficult to generalize. Presence of ecotype variation, different reproductive modes and a wide geographic distribution imply that an extensive and diverse genetic adaptability for survival under fierce environmental conditions exists within <i>D. eriantha</i> . $2n = 18, 27, 36, 40, 45, 50, 54, 108$ . In a mixed collection of seeding lines from various parts of Africa, it was found that almost 60% of tufted accessions were diploid ( $2n = 18$ or $20$ ) about 70% of the stoloniferous accessions ( $2n = 34$ or $36$ ) were tetraploid."
	Cook, B.G. et al. (2005). Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 10 Dec 2014]	[Assessment of non-seeding genotype. Both seedless and seeding genotypes exist, each with the ability to spread and naturalize] "This is such a diverse species (see Table 1), that from time to time it has been necessary to refer to some of the former species in the text." ... "An extremely variable species, comprising a number of morphologically different former species. In general, a perennial, sometimes stoloniferous, or tufted and rhizomatous, rhizomes knotty and unbranched, stolon internodes glabrous or hairy; culms, simple or branched, 35-180 cm tall. Basal leaf sheaths mostly silky and hairy (rarely glabrous); leaf blades 5-60 cm long, 2-14 mm wide, glabrous or hairy; ligule an unfringed membrane, 2-5 mm long. Inflorescence a digitate (single whorl) or subdigitate (2 or more whorls) panicle comprising 3-17 racemes, 5-20 cm long. Spikelets 2-4 mm long; lower glume a membranous scale, upper glume $\frac{1}{2}$ - $\frac{2}{3}$ as long as spikelet; upper glume and lower lemma purple and silvery, covered with 1 mm long hairs. 3.3 million seeds/kg. Morphologically very similar to <i>D. milanjiana</i> , the only consistent difference being that nerves of the lower lemma are smooth in <i>D. eriantha</i> , and scaberulous in <i>D. milanjiana</i> . Also similar to <i>D. didactyla</i> (syn. <i>swazilandensis</i> ), but differs in being more robust (culms of <i>D. eriantha</i> >2.5 mm diameter at base)."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2021). Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2021). 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
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 9 Nov 2021]	"Native: AFRICA South Tropical Africa: Angola; Mozambique; Zimbabwe Southern Africa: Botswana; Namibia; South Africa; Swaziland"

202	Quality of climate match data	High
	<b>Source(s)</b>	<b>Notes</b>
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 9 Nov 2021]	

203	Broad climate suitability (environmental versatility)	y
	<b>Source(s)</b>	<b>Notes</b>
	Cook, B.G., et al. (2020). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 9 Nov 2021]	[Elevation range may exceed 1000 m, demonstrating environmental versatility] "The species extends from about 14–34° S, and from near sea level in South Africa to 2,250 m asl in Lesotho. Warm to hot summers, and cold winters, often with frosts, are experienced over most of this distribution. Average annual temperatures are mostly of the order of 16–24 °C. <i>D. smutsii</i> types appear to have a lower temperature threshold than pangola types, starting growth earlier in the season and growing longer into periods with cool night temperatures. 'Premier' (a <i>D. smutsii</i> type) is usually planted in subtropical areas with an average annual temperature of 15–21 °C, and pangola in subtropics and tropics, with average temperatures from about 19–24 °C. 'Mardi' was selected in an area in the wet tropics with an average annual temperature of 26 °C. Although the species is generally frost sensitive, some difference in frost tolerance and regrowth capacity after frosting among genotypes has been observed."

204	Native or naturalized in regions with tropical or subtropical climates	y
	<b>Source(s)</b>	<b>Notes</b>
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 9 Nov 2021]	"Native: AFRICA South Tropical Africa: Angola; Mozambique; Zimbabwe Southern Africa: Botswana; Namibia; South Africa; Swaziland"
	Imada, C. (2019). Hawaiian Naturalized Vascular Plants Checklist (February 2019 update). Bishop Museum Technical Report 69. Bishop Museum, Honolulu, HI	Naturalized: K O? M Ka? H

205	Does the species have a history of repeated introductions outside its natural range?	y

Qsn #	Question	Answer
	Source(s)	Notes
	<p>USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a>. [Accessed 9 Nov 2021]</p>	<p>[Widely introduced and naturalized]                      "Cultivated                      Africa                      SOUTH TROPICAL AFRICA: Zimbabwe                      Northern America                      REGION: United States (s.)                      Southern America                      CENTRAL AMERICA: Costa Rica [Guanacaste]                      WESTERN SOUTH AMERICA: Ecuador [Galápagos]                      Naturalized                      Pacific                      NORTH-CENTRAL PACIFIC: United States [Hawaii]                      Southern America                      CARIBBEAN: Cuba, United States [Puerto Rico, Virgin Islands, U.S.]                      CENTRAL AMERICA: Costa Rica                      BRAZIL: Brazil                      WESTERN SOUTH AMERICA: Colombia                      SOUTHERN SOUTH AMERICA: Argentina, Paraguay"</p>

301	Naturalized beyond native range	y
	Source(s)	Notes
	<p>Oppenheimer, H. L. (2004). New Hawaiian plant records for 2003. Bishop Museum Occasional Papers. 79: 8-20</p>	<p>"Although Herbst &amp; Clayton (1998: 23) reported specimens from cultivated material on O'ahu and Maui in 1940 and 1939, respectively, they considered the first naturalized record of pangola grass to be from Hawai'i Island in 1942. Recently this species was documented as naturalized on Kaua'i (Staples et al., 2003: 17). On Maui, this is a widespread and abundant pasture grass, sometimes observed to occur in adjacent waste areas as well. Material examined: MAUI: East Maui, Makawao Distr, Haleakalā Branch Station, good growth, spreading, 9 Apr 1939, E.Y.Hosaka 2446 (BISH); mauka of Pu'u Pi'iholo, 610 m, abundant in pasture, 8 Sep 2002, Oppenheimer, F. Duvall, &amp; P. Baldwin H90204."</p>
	<p>Staples, G. W., Imada, C.T. &amp; Herbst, D. R. (2003). New Hawaiian plant records for 2001. Bishop Museum Occasional Papers. 74: 7-21</p>	<p>"<i>Digitaria eriantha</i> previously had been documented from the islands of O'ahu, Kaho'olawe, Maui, and Hawai'i, although it was considered naturalized only on the island of Hawai'i (O'Connor in Wagner et al., 1999: 1530 [as <i>D. pentzii</i>]; Herbst &amp; Clayton, 1998: 23). The following collection documents the presence of pangola grass on the island of Kaua'i, where it appears to be naturalized. Material examined. KAUA'I: occasional along road and cleared areas near wet cave, 16 Jun 1978, C. Corn s. n. (BISH 667056)."</p>
	<p>Laegaard, S. &amp; Garcia, P.P. (2004). Invasive grasses in the Galapagos Islands. <i>Lyonia</i> 6(2): 171-175</p>	<p>"<i>Digitaria eriantha</i>, previously known as <i>D. decumbens</i> or <i>D. pentzii</i>, is also from SE Africa. The species has only very recently been recorded from the mainland of Ecuador (A.M. Vega, pers. comm.) but it has for several years been cultivated for grazing at mid-altitudes of S Cruz. It is widely naturalized along roads and trails here."</p>

Qsn #	Question	Answer
	Herbst, Derral R. & Clayton, W. D. (1998). Notes on the grasses of Hawai'i: new records, corrections, and name changes. Bishop Museum Occasional Papers. 55:17-38	" <i>Digitaria pentzii</i> Stent (O'Connor, 1990: 1530) is a stoloniferous variant of <i>D. eriantha</i> and was placed in synonymy under the latter species by Gibbs Russell et al. (1990: 110). Although O'Connor cites a 1963 Shipman collection from the island of Hawai'i as the earliest documentation of the species in the state, the first collection actually was from an experimental grass plot on Maui in 1939 (Hosaka 2446); it also was cultivated on O'ahu at about the same time. The earliest collection of the grass as a naturalized species probably was that of Fagerlund and Mitchell in 1942. Material examined. O'AHU: Hawai'i Agricultural Experimental Station, Pensacola, 200 ft, 10 Aug 1940, collector unknown (BISH 448178); MAUI: Makawao, Haleakala Branch Agricultural Experimental Station, 9 Apr 1939, Hosaka 2446 (BISH); HAWAII: Volcano House garden, 1 Dec 1942, Fagerlund & Mitchell 224 (BISH)."
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 9 Nov 2021]	"Naturalized Pacific NORTH-CENTRAL PACIFIC: United States [Hawaii] Southern America CARIBBEAN: Cuba, United States [Puerto Rico, Virgin Islands, U.S.] CENTRAL AMERICA: Costa Rica BRAZIL: Brazil WESTERN SOUTH AMERICA: Colombia SOUTHERN SOUTH AMERICA: Argentina, Paraguay"

302	Garden/amenity/disturbance weed	n
	Source(s)	Notes
	WRA Specialist. (2021). Personal Communication	Widely naturalized, and regarded as an environmental weed in Queensland, Australia

303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	Laegaard, S. & Garcia, P.P. (2004). Invasive grasses in the Galapagos Islands. <i>Lyonia</i> 6(2): 171-175	"...it has for several years been cultivated for grazing at mid-altitudes of S Cruz. It is widely naturalized along roads and trails here. It is low and rather soft and does not seem very strong as a competitor but it should be kept under observation."
	Cook, B.G., et al. (2020). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 9 Nov 2021]	"Generally not considered a serious weed. The stoloniferous type, pangola, is sterile and can only spread vegetatively. While seeding varieties can persist on infertile soil, they are very palatable to grass-eating herbivores."
	Smith, J. & Valenzuela, H. (2002). Pangolagrass. Sustainable Agriculture Cover Crops Aug. 2002, SA-CC-2. College of Tropical Agriculture and Human Resources, Honolulu, HI. <a href="http://www.ctahr.hawaii.edu">www.ctahr.hawaii.edu</a>	[In the Hawaiian Islands, generally regarded as a desirable pasture grass] "It is not considered invasive, unlike some other pasture grasses, because it does not produce seed and is easy to control or eliminate."

304	Environmental weed	y
	Source(s)	Notes

Qsn #	Question	Answer
	Queensland Government. (2021). Weeds of Australia - Pangola grass <i>Digitaria eriantha</i> subsp. <i>pentzii</i> . <a href="https://keyserver.lucidcentral.org/weeds/data/media/html/digitaria_eriantha.htm">https://keyserver.lucidcentral.org/weeds/data/media/html/digitaria_eriantha.htm</a> . [Accessed 9 Nov 2021]	"Pangola grass ( <i>Digitaria eriantha</i> subsp. <i>pentzii</i> ) is regarded as an environmental weed in south-eastern Queensland, and it appears on the list of the top 200 most invasive plants for this region. It has escaped cultivation and forms dense populations along waterways (i.e. in riparian areas) and in open woodlands. It has also been recorded as a weed of beaches in Sarina Shire in northern Queensland, where it dominates areas and excludes native species."
	Urban Design, Cultural Heritage & Landscape Unit & Land for Wildlife. (2002). Guidelines for Undesirable Plants for Natural Bushland & Waterways. Information Sheet 5. <a href="https://www.goldcoast.qld.gov.au">https://www.goldcoast.qld.gov.au</a> . [Accessed 9 Nov 2021]	"The following is a list of introduced plants which readily spread to bushland and waterways" ... " <i>Digitaria eriantha</i> ... Pasture grass spreading to bushland"

305	Congeneric weed	y
	Source(s)	Notes
	Kabanyoro, R. 2001. Responses of the weed <i>Digitaria abyssinica</i> (A. Rich. ) Stapf to selective grass herbicides in Ugandan cotton. PhD Dissertation. University of Newcastle, Newcastle, UK	" <i>D. abyssinica</i> is widely distributed in the moisture regions of East Africa from sea level to 3000 m. It is a common component of the natural grasslands at higher altitudes. <i>D. abyssinica</i> . It is the most troublesome weed which occurs in a range of crops such as coffee, tea, sisal, pyrethrum, cotton and many other annual and perennial crops in Kenya, Tanzania and Uganda and it is also present in Ethiopia, Malawi, Somalia, Sudan and Zambia (Terry and Michieka, 1987)." ... "With a heavy infestation of <i>D. abyssinica</i> , both growth and yield of crop plants are tremendously reduced (Ivens, 1967 and Mbevi, 1997). It is regarded as the most troublesome weed of arable land in some parts of East Africa (Otieno, 1967)."

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Clayton, W.D., Vorontsova, M.S., Harman, K.T. and Williamson, H. (2006 onwards). GrassBase - The Online World Grass Flora. <a href="http://www.kew.org/data/grasses-db.html">http://www.kew.org/data/grasses-db.html</a> . [Accessed 9 Nov 2021]	"Perennial; caespitose. Cataphylls evident. Stolons absent, or present. Butt sheaths sparsely hairy; persistent and investing base of culm; with compacted dead sheaths. Culms erect, or geniculately ascending; 40–120 cm long. Culm-internodes distally glabrous. Culm-nodes brown; glabrous. Leaf-sheaths scaberulous; glabrous on surface, or pilose. Ligule a ciliolate membrane; 2–4 mm long. Leaf-blades flat, or involute; 5–20 cm long; 2–4(–7) mm wide. Leaf blade surface scaberulous; rough on both sides. Leaf-blade margins scabrous"

Qsn #	Question	Answer
402	<b>Allelopathic</b>	
	<b>Source(s)</b>	<b>Notes</b>
	Laan, M. V. D., Reinhardt, C. F., Belz, R. G., Truter, W. F., Foxcroft, L. C., & Hurlle, K. 2008. Interference potential of the perennial grasses <i>Eragrostis curvula</i> , <i>Panicum maximum</i> and <i>Digitaria eriantha</i> with <i>Parthenium hysterophorus</i> . <i>Tropical Grasslands</i> , 4 (2):88–95	[No allelopathic properties demonstrated in this study] "A field trial was established in Kruger National Park (South Africa) to investigate the interference between parthenium and 3 indigenous grass species, namely: <i>Eragrostis curvula</i> , <i>Panicum maximum</i> and <i>Digitaria eriantha</i> ." ... "Our preliminary investigations into possible allelopathic effects of the grasses on parthenium revealed that root leachates from all 3 grass species had no phytotoxic effect on parthenium germination or its early development. However, further investigation is warranted."

403	<b>Parasitic</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Quattrocchi, U. (2006). <i>CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology</i> . CRC Press, Boca Raton, FL	No evidence. Poaceae

404	<b>Unpalatable to grazing animals</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Cook, B.G., et al. (2020). <i>Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8</i> . <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 9 Nov 2021]	"All genotypes of <i>D. eriantha</i> are tolerant of heavy grazing. Regular grazing is necessary to maintain quality and to minimise disease incidence. Probably best if the grass is maintained between 10–15 and 30–40 cm, although this may not be feasible under sheep grazing. Ideally, it should be grazed every 2–3 weeks."
	Quattrocchi, U. (2006). <i>CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology</i> . CRC Press, Boca Raton, FL	"excellent hay, high feeding value, cultivated fodder grass, very high grazing value, excellent pasture grass, highly digestible, highly palatable when young and vigorous" ... "withstands trampling and overgrazing..."
	Hedayetullah, M., & Zaman, P. (Eds.). (2019). <i>Forage Crops of the World, Volume II: Minor Forage Crops</i> . Apple Academic Press Inc., Oakville, ON	"The grass is popular because of the ease of establishments, good forage production, high nutritive value, and excellent palatability."

405	<b>Toxic to animals</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Cook, B.G., et al. (2020). <i>Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8</i> . <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 9 Nov 2021]	[Low risk of toxicity] "No record of toxicity. Contains low levels of soluble oxalate and therefore has low risk of causing oxalate-related animal health problems, i.e. suitable for horses and lactating cows."
	Quattrocchi, U. (2006). <i>CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology</i> . CRC Press, Boca Raton, FL	[No evidence] "excellent hay, high feeding value, cultivated fodder grass, very high grazing value, excellent pasture grass, highly digestible, highly palatable when young and vigorous"

406	<b>Host for recognized pests and pathogens</b>	
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Qsn #	Question	Answer
	Source(s)	Notes
	Cook, B.G., et al. (2020). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 9 Nov 2021]	"Susceptibility to rust ( <i>Puccinia oahuensis</i> ) varies among genotypes. False smut ( <i>Ephelis</i> sp.) in seed heads is a minor problem, particularly during prolonged wet periods. Pangola grass is also attacked by the fungi, <i>Mycosphaerella tassina</i> , <i>Piricularia grisea</i> , and <i>Rhizoctonia solani</i> . The most serious disease of <i>D. eriantha</i> is pangola stunt virus, transmitted by whitebacked planthopper ( <i>Sogatella furcifera</i> Homoptera: Delphacidae), or <i>S. kolophon</i> . Symptoms are stunting, yellowing, reddening, and twisting of leaves and inflorescences, swelling of small veins, and excessive tillering. Other viruses include <i>digitaria striate cytorhabdovirus</i> (chlorotic spots and stripes), pangola stunt fijiivirus, sugarcane mosaic potyvirus, and potato virus Y. Nematodes include: <i>Belonolaimus longicaudatus</i> (sting nematode), <i>Dolichodorum nigeriensis</i> , <i>Helicotylenchus pseudorobustus</i> , <i>Meloidogyne incognita</i> , <i>Peltamigratus nigeriensis</i> , <i>Pratylenchus brachyurus</i> (root lesion nematode), <i>Rotylenchulus reniformis</i> , and <i>Scutellonema clathricaudatum</i> . However, 'Pangola' is largely resistant to root-knot nematode and is recommended as a rotation crop on sandy soils infested with cotton root-knot nematode ( <i>Meloidogyne incognita</i> ). Insects pests include spittlebugs ( <i>Tomaspis flavopicta</i> , <i>T. humeralis</i> , <i>Prosapia bicincta</i> ), rhodes grass mealy bug ( <i>Antonina graminis</i> ), chinch bug ( <i>Blissus leucopterus</i> ), sugarcane aphid ( <i>Sipha flava</i> ), army worms ( <i>Laphigma</i> spp., <i>Spodoptera</i> spp. and <i>Mocis</i> spp.), mole crickets and leafhoppers."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Cook, B.G., et al. (2020). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 9 Nov 2021]	"No record of toxicity."
	Quattrocchi, U. (2012). CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence
	Wagstaff, D.J. (2008). International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence

408	Creates a fire hazard in natural ecosystems	y
	Source(s)	Notes
	Sarina Landcare Catchment Management Association. (2008). Sarina Coastal Sustainable Landscapes Project - Grasstree Beach. <a href="http://www.mackay.qld.gov.au">http://www.mackay.qld.gov.au</a> . [Accessed 9 Nov 2021]	"Environmental weeds such as Guinea grass ( <i>Panicum maximum</i> ) and couch ( <i>Digitaria eriantha</i> ) are also present and pose a fire risk due to the large flammable fuel loads they create."

Qsn #	Question	Answer
	Cook, B.G., et al. (2020). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 9 Nov 2021]	[Could provide fuel for fire during drought conditions] "D. eriantha is found in areas with average annual rainfall ranging from 300-1,300 mm, although mostly from 450-800 mm. All types are very drought tolerant. "
	de Bruno Austin, C., Trollope, W. S., Trollope, L. A., Sowry, R., & Connolly, B. 2011. Development of Open Ended Fire Breaks in the Kruger National Park, South Africa. In: Living with Fire Addressing Global Change through Integrated Fire Management. Sun City, South Africa, 9-13 May 2011	[High flammability] "Digitaria eriantha was the dominant grass species in all the fire break transects. The high flammability factor of this grass species contributed significantly to the spread of the fire even though the percentage grass curing was relatively low, 30–40%, and resulted in a clean burn." ... "The explanation for this phenomenon is that Digitaria eriantha, Themeda triandra and many other species of grass dry off in the winter from the bottom up resulting in higher levels of dead material at the base of the grass tufts thereby facilitating the ignition of the grass tufts and the spread of the fire."

409	Is a shade tolerant plant at some stage of its life cycle	n
	Source(s)	Notes
	Cook, B.G., et al. (2020). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 9 Nov 2021]	"D. eriantha is generally considered to have low shade tolerance, although some types appear to be more shade tolerant than others e.g. in Malaysia, D. setivalva rated "medium" for shade tolerance (cf. Brachiaria brizantha , B. decumbens , and Setaria sphacelata ), while D. decumbens and D. pentzii rated low (cf. Cynodon plectostachyus and Brachiaria mutica )."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Cook, B.G., et al. (2020). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 9 Nov 2021]	"D. eriantha is largely found on lighter well drained soils (sands, sandy loams, loams and clay loams) but rarely on clays. Seeding types tend to be restricted to sandy soils in their native habitat, possibly because seedlings do not establish readily on heavier soils without disturbance. Both tufted and stoloniferous seeding types are mostly used on sandy soils in cultivation, although they will grow on clay soils, once established. Pangola types are used on a wide range of soils from sands to heavy clays, of low or high fertility. While pH at collection sites range from (4.4–) 6.0–7.0 (–9.1), adaptation may not be universal within the species, but specific to a particular ecotype. In cultivation, the pangola types appear slightly more acid-tolerant and less alkali-tolerant than the seeding types, with a suggested range of (4.5–) 5.0–6.0 (–7), compared with (4.5–) 5.5–7.0 (–8.5) for the seeding types. Pangola has low to moderate salt/alkalinity tolerance, and moderate tolerance of aluminium (to 34% saturation of CEC). The species can survive on soils of relatively low fertility, but responds strongly to fertility improvement."
	Csurhes, S. & Edwards, R. (1998). Potential environmental weeds in Australia: Candidate species for preventative control. Biodiversity Group, Environment Australia, Canberra, Australia	"It will grow in a range of soils and tolerates drought and high soil acidity. It does not tolerate prolonged waterlogging or alkaline conditions. Growth is most prolific in moist, fertile, well drained soil in areas where annual rainfall exceeds 800 mm."

Qsn #	Question	Answer
	Hedayetullah, M., & Zaman, P. (Eds.). (2019). Forage Crops of the World, Volume II: Minor Forage Crops. Apple Academic Press Inc., Oakville, ON	"The grass can grow on various types of soil from acid with 4.5 pH to alkaline with 8.5 pH but clayey soils are less suitable than loams. It withstands water logging only to a limited extent. During the cool season, especially at higher elevations, the productivity of pangola grass is very low, and a rotation cycle of 60 days or more is recommended (Fukumoto and Lee, 2003)."

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Hedayetullah, M., & Zaman, P. (Eds.). (2019). Forage Crops of the World, Volume II: Minor Forage Crops. Apple Academic Press Inc., Oakville, ON	"The grass is a swallow-rooted perennial with long creeping stolons forming tufts. Its culms are simple or branched, 35–180-cm tall. The leaf blades are 5–60-cm long, 2–14-mm wide, glabrous, or hairy. This grass is sometimes stoloniferous or tufted and rhizomatous. The stolons spread over the surface of the ground and develop roots at the nodes. The stolons and stems are hairy."

412	Forms dense thickets	y
	Source(s)	Notes
	Queensland Government. (2021). Weeds of Australia - Pangola grass <i>Digitaria eriantha</i> subsp. <i>pentzii</i> . <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/digitaria_eriantha.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/digitaria_eriantha.htm</a> . [Accessed 9 Nov 2021]	"It has escaped cultivation and forms dense populations along waterways (i.e. in riparian areas) and in open woodlands. It has also been recorded as a weed of beaches in Sarina Shire in northern Queensland, where it dominates areas and excludes native species."
	Cook, B.G., et al. (2020). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 9 Nov 2021]	"Tussock types combine well with other species, but stoloniferous types can be very competitive and suppress companion legumes."

501	Aquatic	n
	Source(s)	Notes
	Cook, B.G., et al. (2020). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 9 Nov 2021]	[Terrestrial, but tolerant of flooding] "Pangola types are more tolerant of flooding and waterlogging than seeding types."

502	Grass	y
	Source(s)	Notes
	Quattrocchi, U. (2006). CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	Poaceae

Qsn #	Question	Answer
503	<b>Nitrogen fixing woody plant</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Quattrocchi, U. (2006). CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	Poaceae

504	<b>Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Hedayetullah, M., & Zaman, P. (Eds.). (2019). Forage Crops of the World, Volume II: Minor Forage Crops. Apple Academic Press Inc., Oakville, ON	"The grass is a swallow-rooted perennial with long creeping stolons forming tufts. Its culms are simple or branched, 35–180-cm tall. The leaf blades are 5–60-cm long, 2–14-mm wide, glabrous, or hairy. This grass is sometimes stoloniferous or tufted and rhizomatous. The stolons spread over the surface of the ground and develop roots at the nodes. The stolons and stems are hairy."

601	<b>Evidence of substantial reproductive failure in native habitat</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Cook, B.G., et al. (2020). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 9 Nov 2021]	[Non-seeding, but able to reproduce vegetatively] "The stoloniferous type, pangola, is sterile and can only spread vegetatively. While seeding varieties can persist on infertile soil, they are very palatable to grass-eating herbivores."

602	<b>Produces viable seed</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	CTAHR Sustainable and Organic Program. (2002). Pangola Grass - <i>Digitaria eriantha</i> . <a href="http://www.ctahr.hawaii.edu/sustainag/cc-gm/pangola.html">http://www.ctahr.hawaii.edu/sustainag/cc-gm/pangola.html</a> . [Accessed 9 Nov 2021]	"No seed available - only established by vegetative propagation (sprigs, plugs)"
	Cook, B.G., et al. (2020). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 9 Nov 2021]	[This assessment is for the non-seeding genotype] "Many of the stoloniferous types produce little or no seed and must be propagated vegetatively. A bulky stand with a high proportion of culms and ascending or arching stolons is cut by hand or with a forage harvester, and the material spread on a cultivated surface at 0.5–2 t of green matter per hectare. This is then cultivated into prepared ground and rolled. Alternatively pieces of stolon can be pushed into the soil on about a metre grid. Under good growing conditions, vegetatively planted swards establish rapidly, suppressing weeds in the process. Seeding varieties require a fine, firm, clean seedbed for establishment, to avoid competition in the early stages. Seed is slightly hairy and may not flow readily through some planting equipment. Mixing seed with superphosphate, or sawdust or pelleting facilitates flow. Stoloniferous types establish more readily than tufted ones."

603	<b>Hybridizes naturally</b>	
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Pozzobon, M. T., Glatzle, A., Conterato, I. F., Schifino-Wittmann, M. T., & Smiderle, V. G. (2006). Variation in chromosome number and its relationship with agronomic characteristics in a germplasm collection of <i>Digitaria eriantha</i> sensu lato. <i>Tropical Grasslands</i> , 4 (4): 157–164	[Unknown] "One point that must be considered when crosses are involved is the chromosome number of the potential parents, as differences in chromosome number normally lead to decreased hybrid fertility (or even sterility), owing to problems during meiosis and therefore a low percentage of viable gametes. Therefore, the objective of this paper was to: determine the chromosome numbers of the accessions in the INTTAS <i>Digitaria</i> collection; estimate their pollen fertility; and try to correlate chromosome numbers and agronomic characteristics."

604	Self-compatible or apomictic	n
	<b>Source(s)</b>	<b>Notes</b>
	Pozzobon, M. T., Glatzle, A., Conterato, I. F., Schifino-Wittmann, M. T., & Smiderle, V. G. (2006). Variation in chromosome number and its relationship with agronomic characteristics in a germplasm collection of <i>Digitaria eriantha</i> sensu lato. <i>Tropical Grasslands</i> , 4 (4): 157–164	[Unable to produce seeds through self-fertilization or apomixes] "This lack of seed production, probably due to a degeneration of the megaspore-mothercell (Sotomayor-Ríos and Schank 2001) is the major drawback to Pangola cultivation, as propagation is almost entirely vegetative, which raises the costs to establish a pasture."

605	Requires specialist pollinators	n
	<b>Source(s)</b>	<b>Notes</b>
	Zomlefer, W.B. (1994). <i>Guide to Flowering Plant Families</i> . The University of North Carolina Press, Chapel Hill & London	Poaceae [anemophilous. Wind-pollinated]

606	Reproduction by vegetative fragmentation	y
	<b>Source(s)</b>	<b>Notes</b>
	Hedayetullah, M., & Zaman, P. (Eds.). (2019). <i>Forage Crops of the World, Volume II: Minor Forage Crops</i> . Apple Academic Press Inc., Oakville, ON	"This grass is sometimes stoloniferous or tufted and rhizomatous. The stolons spread over the surface of the ground and develop roots at the nodes."
	Cook, B.G., et al. (2020). <i>Tropical Forages: an interactive selection tool</i> – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 9 Nov 2021]	[Non-seeding genotype spreads by stolons] "Spreads by seed and/or stolons depending on genotype."

607	Minimum generative time (years)	1
	<b>Source(s)</b>	<b>Notes</b>
	Hedayetullah, M., & Zaman, P. (Eds.). (2019). <i>Forage Crops of the World, Volume II: Minor Forage Crops</i> . Apple Academic Press Inc., Oakville, ON	[Assessment of non-seeding, stoloniferous genotype. Should be able to spread vegetatively by stolons within first year of growth] "This grass is sometimes stoloniferous or tufted and rhizomatous. The stolons spread over the surface of the ground and develop roots at the nodes."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Laegaard, S. & Garcia, P.P. (2004). Invasive grasses in the Galapagos Islands. <i>Lyonia</i> 6(2): 171-175	[Stolon fragments may possibly be moved along heavily trafficked corridors] "It is widely naturalized along roads and trails here."

702	Propagules dispersed intentionally by people	y
	<b>Source(s)</b>	<b>Notes</b>
	Hedayetullah, M., & Zaman, P. (Eds.). (2019). <i>Forage Crops of the World, Volume II: Minor Forage Crops</i> . Apple Academic Press Inc., Oakville, ON	"As an outstanding pasture grass, <i>Digitaria decumbens</i> soon spread to West Indies, Australia, West and East Africa, the Philippines, Hawaii, India, Pakistan, Malaysia, etc. in tropical, subtropical, and even temperate warm countries."

703	Propagules likely to disperse as a produce contaminant	n
	<b>Source(s)</b>	<b>Notes</b>
	CTAHR Sustainable and Organic Program. (2002). <i>Pangola Grass - Digitaria eriantha</i> . <a href="http://www.ctahr.hawaii.edu/sustainag/cc-gm/pangola.html">http://www.ctahr.hawaii.edu/sustainag/cc-gm/pangola.html</a> . [Accessed 9 Nov 2021]	"No seed available - only established by vegetative propagation (sprigs, plugs)"

704	Propagules adapted to wind dispersal	n
	<b>Source(s)</b>	<b>Notes</b>
	CTAHR Sustainable and Organic Program. (2002). <i>Pangola Grass - Digitaria eriantha</i> . <a href="http://www.ctahr.hawaii.edu/sustainag/cc-gm/pangola.html">http://www.ctahr.hawaii.edu/sustainag/cc-gm/pangola.html</a> . [Accessed 9 Nov 2021]	"No seed available - only established by vegetative propagation (sprigs, plugs)"

705	Propagules water dispersed	
	<b>Source(s)</b>	<b>Notes</b>
	CTAHR Sustainable and Organic Program. (2002). <i>Pangola Grass - Digitaria eriantha</i> . <a href="http://www.ctahr.hawaii.edu/sustainag/cc-gm/pangola.html">http://www.ctahr.hawaii.edu/sustainag/cc-gm/pangola.html</a> . [Accessed 9 Nov 2021]	[Unknown. Possible that stolon fragments could be dispersed by water] "No seed available - only established by vegetative propagation (sprigs, plugs)" ... "Pangola grass grows vigorously and spreads rapidly by stolons. It does not produce viable seeds"

706	Propagules bird dispersed	n
	<b>Source(s)</b>	<b>Notes</b>
	CTAHR Sustainable and Organic Program. (2002). <i>Pangola Grass - Digitaria eriantha</i> . <a href="http://www.ctahr.hawaii.edu/sustainag/cc-gm/pangola.html">http://www.ctahr.hawaii.edu/sustainag/cc-gm/pangola.html</a> . [Accessed 9 Nov 2021]	"Pangola grass does not produce viable seed"

707	Propagules dispersed by other animals (externally)	n
	<b>Source(s)</b>	<b>Notes</b>

Qsn #	Question	Answer
	Pozzobon, M. T., Glatzle, A., Conterato, I. F., Schifino-Wittmann, M. T., & Smiderle, V. G. (2006). Variation in chromosome number and its relationship with agronomic characteristics in a germplasm collection of <i>Digitaria eriantha sensu lato</i> . <i>Tropical Grasslands</i> , 4 (4): 157–164	[Assessment is for non-seeding genotype] "This lack of seed production, probably due to a degeneration of the megaspore-mothercell (Sotomayor-Ríos and Schank 2001) is the major drawback to Pangola cultivation, as propagation is almost entirely vegetative, which raises the costs to establish a pasture."

708	Propagules survive passage through the gut	n
	Source(s)	Notes
	Quattrocchi, U. (2006). <i>CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology</i> . CRC Press, Boca Raton, FL	[Unlikely, as does not produce seeds] "excellent hay, high feeding value, cultivated fodder grass, very high grazing value, excellent pasture grass, highly digestible, highly palatable when young and vigorous" ... "withstands trampling and overgrazing..." ... "it does not produce viable seeds"

801	Prolific seed production (>1000/m2)	n
	Source(s)	Notes
	Cook, B.G., et al. (2020). <i>Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8</i> . <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 9 Nov 2021]	"Many of the stoloniferous types produce little or no seed and must be propagated vegetatively. A bulky stand with a high proportion of culms and ascending or arching stolons is cut by hand or with a forage harvester, and the material spread on a cultivated surface at 0.5–2 t of green matter per hectare. This is then cultivated into prepared ground and rolled. Alternatively pieces of stolon can be pushed into the soil on about a metre grid. Under good growing conditions, vegetatively planted swards establish rapidly, suppressing weeds in the process. Seeding varieties require a fine, firm, clean seedbed for establishment, to avoid competition in the early stages. Seed is slightly hairy and may not flow readily through some planting equipment. Mixing seed with superphosphate, or sawdust or pelleting facilitates flow. Stoloniferous types establish more readily than tufted ones."

802	Evidence that a persistent propagule bank is formed (>1 yr)	n
	Source(s)	Notes
	CTAHR Sustainable and Organic Program. (2002). <i>Pangola Grass - Digitaria eriantha</i> . <a href="http://www.ctahr.hawaii.edu/sustainag/cc-gm/pangola.html">http://www.ctahr.hawaii.edu/sustainag/cc-gm/pangola.html</a> . [Accessed 9 Nov 2021]	[May persist and spread from stolons] "No seed available - only established by vegetative propagation (sprigs, plugs)"

Qsn #	Question	Answer
803	<b>Well controlled by herbicides</b>	
	<b>Source(s)</b>	<b>Notes</b>
	Cook, B.G., et al. (2020). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 9 Nov 2021]	"Herbicide effects - No information available."
	Pastures Australia. (2007). Pangola grass - <i>Digitaria eriantha</i> . <a href="https://keys.lucidcentral.org/keys/v3/pastures/Html/Pangola_grass.htm">https://keys.lucidcentral.org/keys/v3/pastures/Html/Pangola_grass.htm</a> . [Accessed 9 Nov 2021]	"Herbicide susceptibility - No information. Probably susceptible to glyphosate"

804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	<b>Source(s)</b>	<b>Notes</b>
	Quattrocchi, U. (2006). CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"withstands trampling and overgrazing..."
	Cook, B.G., et al. (2020). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 9 Nov 2021]	"Fire - Tolerant of fire."
	Hedayetullah, M., & Zaman, P. (Eds.). (2019). Forage Crops of the World, Volume II: Minor Forage Crops. Apple Academic Press Inc., Oakville, ON	"It withstands very heavy grazing (FAO, 2009)."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y
	<b>Source(s)</b>	<b>Notes</b>
	Thorne, M.S., Fukumoto, G.K., Wright, M., Mack, J., Oshiro, M., Wilson, S. & Oishi, D. (2018). Two-lined Spittlebug ( <i>Prosapia bicincta</i> (Say)) in Hawaii. UH-CTAHR, Honolulu, HI	"Two-lined spittlebug (TLSB), <i>Prosapia bicincta</i> , (Hemiptera; Cercopidae) was first detected in Kailua- Kona, on the Big Island of Hawaii in September of 2016 where it had caused severe damage to nearly 2,000 acres of pasture land. The pest has since rapidly expanded its range and is now causing damage to rangelands across an estimated 125,900 acres between Hualalai in the north and Keokea in the south. In highly infested areas, TLSB has resulted in nearly 100% die back of the dominant and key pasture grasses including Kikuyu ( <i>Pennisetum clandestinum</i> ) and pangola ( <i>Digitaria eriantha</i> ) grasses. The loss of these important livestock forages provides entry for the establishment of many undesirable, and often invasive plants such as Pamakani ( <i>Eupatorium adenophorum</i> ), wild blackberry ( <i>Rubus</i> spp.), fireweed ( <i>Senecio madagascariensis</i> ), Hilo grass ( <i>Paspalum conjugatum</i> ), several other minor grasses of low forage quality, and other weeds. Currently TLSB appears to be isolated to the North Kona area, but because of its seeming preference for key livestock forage grasses it has the potential to spread throughout the islands and irreparably harm large areas of valuable livestock grazing lands. Consequently, TLSB is poised to become a major economic threat to the pasture-based livestock industry in Hawaii unless steps are taken to control the pest."



**Summary of Risk Traits:**

## High Risk / Undesirable Traits

- Elevation range exceeds 1000 m, demonstrating environmental versatility
- Thrives in tropical climates
- Widely naturalizing, including the Hawaiian Islands of Kauai, Oahu, Kahoolawe, Maui, and Hawaii
- Considered an environmental weed in Queensland, Australia,
- Other *Digitaria* species have become invasive
- High flammability (may increase fire risk in arid, fire prone habitats)
- Forms dense stands in Australia, excluding other vegetation
- Tolerates many soil types
- Spreads vegetatively
- Tolerates grazing and fire

## Low Risk Traits

- Not reported to be a seriously invasive or habitat-modifying weed in the Hawaiian Islands
- Unarmed (no spines, thorns or burrs)
- Non-toxic
- Palatable, and provides valuable forage for livestock
- Shade-intolerant
- Does not produce seeds
- Lack of seed production could limit potential to disperse accidentally
- Impacts of Two-lined Spittlebug (TLSB) in Hawaii will likely reduce pangola grass cover and minimize risk of invasiveness where TLSB is present