

Taxon: *Sidastrum micranthum* (A. St.-Hil.) Fryxell

Family: Malvaceae

Common Name(s): dainty sandmallow
sand mallow

Synonym(s): *Sida micrantha* A. St.-Hil.

Assessor: Chuck Chimera

Status: Assessor Approved

End Date: 29 Jun 2022

WRA Score: 8.0

Designation: H(HPWRA)

Rating: High Risk

Keywords: Herbs/Shrub, Naturalized, Pasture Weed, Autochorous, Seed Contaminant

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		
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	y
304	Environmental weed		
305	Congeneric weed		
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		
405	Toxic to animals	y=1, n=0	n
406	Host for recognized pests and pathogens	y=1, n=0	y
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	y=1, n=0	y

Qsn #	Question	Answer Option	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)		
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets		
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
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	y
603	Hybridizes naturally		
604	Self-compatible or apomictic		
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation		
607	Minimum generative time (years)		
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	y
702	Propagules dispersed intentionally by people	y=1, n=-1	n
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	y
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)		
708	Propagules survive passage through the gut	y=1, n=-1	n
801	Prolific seed production (>1000/m ²)		
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides	y=-1, n=1	y
804	Tolerates, or benefits from, mutilation, cultivation, or fire		
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
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Not domesticated] "Widespread in South America, the Caribbean, and Central America; in Hawai'i naturalized in pastures of Makaleha Valley, O'ahu, and Ka'awaloa, Hawai'i. First observed at Ka'awaloa about 1900 and collected in 1948 (Greenwell & Greenwell 19369, BISH)."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2022). 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
	USDA, Agricultural Research Service, National Plant Germplasm System. (2022). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 28 Jun 2022]	"Native Southern America CARIBBEAN: Cuba CENTRAL AMERICA: Costa Rica NORTHERN SOUTH AMERICA: Guyana, Venezuela [Bolívar] BRAZIL: Brazil [Bahia, Minas Gerais] WESTERN SOUTH AMERICA: Bolivia, Colombia"

202	Quality of climate match data	High
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2022). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 28 Jun 2022]	

203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	Tropicos.org. (2022). Tropicos v3.3.2. Missouri Botanical Garden. http://www.tropicos.org/ . [Accessed 29 Jun 2022]	<i>Sidastrum micranthum</i> collected at elevations from 0 - 1200 m [Broad elevation range at tropical latitudes]

Qsn #	Question	Answer
204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2022). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 28 Jun 2022]	"Native Southern America CARIBBEAN: Cuba CENTRAL AMERICA: Costa Rica NORTHERN SOUTH AMERICA: Guyana, Venezuela [Bolívar] BRAZIL: Brazil [Bahia, Minas Gerais] WESTERN SOUTH AMERICA: Bolivia, Colombia"
	Oppenheimer, H. (2008). New Hawaiian plant records for 2007. Bishop Museum Occasional Papers 100: 22-38	" <i>Sidastrum micranthum</i> (A. St. Hil.) Fryxell. New island record. Naturalized on O'ahu, Moloka'i, East Maui, and Hawai'i (Wagner et al. 1999a: 901; Starr et al. 2003: 28; Oppenheimer 2007: 27), this species has been recently collected on Lāna'i. Material examined. LĀNA'I: WSW of Pu'u Māhana, uncommon in remnant dry forest, 530 m, 3 Jan 2007, Oppenheimer, Perlman & Tangalin H10704."

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"References: Brazil-W-255, Brazil-W-362, Brazil-W-407, United States of America-N-301, United States of America-N-839, United States of America-N-1292, India-W-1977."
	Shimpale, V. B., Sutar, S. P., & Yadav, S. R. (2009). <i>Sidastrum</i> (Malvaceae): A new genus record for Asia. <i>Rheedea</i> , 19(1/2), 50-52	"The occurrence of this species in the vicinity of Kolhapur Railway station in a small population suggests that it is probably a recent introduction through imported seeds or food grains."

301	Naturalized beyond native range	y
	Source(s)	Notes
	Wang, Q. L., Lin, G. X., Deng, Y. F., Wang, Z. N., & Yan, X. X. (2017). <i>Sidastrum</i> Baker f. (Malvaceae), A Newly Recorded Genus from China. <i>Journal of Tropical and Subtropical Botany</i> , 25(2), 179-181	"Abstract: <i>Sidastrum</i> Baker f. (Malvaceae) is reported as a newly naturalized genus in China. <i>Sidastrum micranthum</i> (A. St.-Hil.) Fryxell was found in Guangdong, China for the first time. The voucher specimens are deposited in Tropical Crops Genetic Resources Institute, Chinese Academy of Tropical Agricultural Sciences, Hainan (ATCH)."
	Shimpale, V. B., Sutar, S. P., & Yadav, S. R. (2009). <i>Sidastrum</i> (Malvaceae): A new genus record for Asia. <i>Rheedea</i> , 19(1/2), 50-52	"The genus <i>Sidastrum</i> Baker f. represented by <i>S. micranthum</i> (A. St.-Hil.) Fryxell (Malvaceae) is reported first time for Asia from Kolhapur district of Maharashtra State, India. Detailed description, illustration and notes on occurrence and distribution of the species are provided in the present paper."
	Lorence, D. H., & Flynn, T. (2006). New naturalized plant records for Kaua'i and Hawai'i. Bishop Museum Occasional Papers, 88, 1-5	[Kauai] " <i>Sidastrum micranthum</i> (A. St.-Hil.) Fryxell. New island record. Previously reported as naturalized on the island of Hawai'i (Wagner et al. 1990), <i>S. micranthum</i> is now also known from the Māhā'ulepū area of southern Kaua'i. Material examined: Kaua'i: Kōloa Distr, Māhā'ulepū, in pasture lands behind Haula Aweoweonui. "Wetland" depression, ca 80 ft [26 m], 8 Oct 2002, T. Flynn 7108 (BISH, PTBG, US)."

Qsn #	Question	Answer
	Starr, F., Starr, K.& Loope, L.L. (2003). New plant records from the Hawaiian Archipelago. Bishop Museum Occasional Papers 74: 23-34	[Maui] " <i>Sidastrum micranthum</i> (St. Hil) Fryxell. New island record. Previously reported from pastures on O'ahu and Hawai'i (Wagner et al., 1999), <i>S. micranthum</i> is now also known from Maui where this tall herb is widespread in pastures in the Kaupo area. Material examined: MAUI: E. Maui, Kaupō, widespread along road and in pastures from 200 ft [61 m] to 1000 ft [305 m], collection made at 350 ft [106 m], 20 Nov 2000, Starr & Martz 001120-1."
	Oppenheimer, H. (2007). New plant records from Moloka'i, Lāna'i, Maui, and Hawai'i for 2006. Bishop Museum Occasional Papers 96:17-34	[Molokai] " <i>Sidastrum micranthum</i> (A. St.-Hil.) Fryxell. New island record. Naturalized on Kaua'i, O'ahu, East Maui, and Hawai'i (Wagner et al. 1999: 901; Lorence & Flynn 2006: 3; Starr et al. 2003: 28), this species has been recently collected on 1 additional island. Material examined. MOLOKA'I: Pōhakupili, 70 m, locally common in pastures, 8 Dec 2006, Oppenheimer H120619."
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Oahu and Hawaii island] "in Hawai'i naturalized in pastures of Makaleha Valley, O'ahu, and Ka'awaloa, Hawai'i. First observed at Ka'awaloa about 1900 and collected in 1948 (Greenwell & Greenwell 19369, BISH)."
	Oppenheimer, H. (2008). New Hawaiian plant records for 2007. Bishop Museum Occasional Papers 100: 22-38	Lanai] " <i>Sidastrum micranthum</i> (A. St. Hil.) Fryxell. New island record. Naturalized on O'ahu, Moloka'i, East Maui, and Hawai'i (Wagner et al. 1999a: 901; Starr et al. 2003: 28; Oppenheimer 2007: 27), this species has been recently collected on Lāna'i. Material examined. LĀNA'I: WSW of Pu'u Māhana, uncommon in remnant dry forest, 530 m, 3 Jan 2007, Oppenheimer, Perlman & Tangalin H10704."

302	Garden/amenity/disturbance weed	
	Source(s)	Notes
	Starr, F., Starr, K.& Loope, L.L. (2003). New plant records from the Hawaiian Archipelago. Bishop Museum Occasional Papers 74: 23-34	"Previously reported from pastures on O'ahu and Hawai'i (Wagner et al., 1999), <i>S. micranthum</i> is now also known from Maui where this tall herb is widespread in pastures in the Kaupo area." [A weed predominantly of pastures, but may benefit from and establish in disturbed habitats]

303	Agricultural/forestry/horticultural weed	y
	Source(s)	Notes
	dos Santos, L. E., et al. (2016). Doses reduzidas de herbicidas hormonais no controle de <i>Sidastrum micranthum</i> . Revista da Universidade Vale do Rio Verde, 14(1), 899-907	"A malva (<i>Sidastrum micranthum</i>) é uma planta invasora de pastagens, que ocorre com frequência em diversos países do mundo como Cuba, Costa Rica, Venezuela, Guiana, Índia e Brasil (LORENZI, 2000; BOVINI et al., 2001; SHIMPALE et al., 2009). Na região central do Brasil, esta planta daninha tem provocado redução na capacidade de pastejo dada sua competição por água, luz, nutrientes e principalmente espaço físico nas áreas de pecuária (POTT et al., 2006)." [Translation: In central Brazil, this weed has caused a reduction in grazing capacity due to its competition for water, light, nutrients and mainly physical space in livestock areas (POTT et al., 2006).]

Qsn #	Question	Answer
	Gámez López, A., Hernández, M., Díaz, R., & Vargas, J. (2011). Characterization of weed flora related to maize crop under irrigation Jojotos production. <i>Agronomía Tropical</i> , 61(2), 133-140	"In order to know the weeds associated with a maize crop under irrigation for the production of maize, <i>Zea mays</i> L., an inventory was conducted in the farm "Mamonal" located Valle de la Pascua parish, municipality Leonardo Infante, State of Guarico, Venezuela." ... "able 1. Class, family, common name and life cycle of the 29 weed species inventoried in the unit of production." [Includes <i>Sidastrum micranthum</i> , listed as one of the main weeds found in this study]
	Lopes, F. S. C., Oliveira, J. V. D., Oliveira, J. E. D. M., Oliveira, M. D. D., & Souza, A. M. D. (2019). Host plants for mealybugs (Hemiptera: Pseudococcidae) in grapevine crops. <i>Pesquisa Agropecuária Tropical</i> , 49: e54421	[Identified as a weed and host of mealybug in grapevine crops] "For <i>P. solenopsis</i> , from 16 identified plants, 10 are new records of host plants for this species (García Morales et al. 2016): <i>Chamaesyce hirta</i> , <i>Chenopodium ambrosioides</i> , <i>Commelina</i> sp., <i>D. horizontalis</i> , <i>S. cordifolia</i> , <i>S. galheirensis</i> , <i>Sidastrum micranthum</i> , <i>Sidastrum</i> sp., <i>T. paniculatum</i> and <i>Waltheria douradinha</i> ." ... "These plants belong mainly to the Malvaceae, Euphorbiaceae and Fabaceae families, and most of them are recorded here for the first time in association with mealybugs (e.g., <i>Herissanthia crispa</i> , <i>Jatropha urens</i> and <i>Mimosa tenuiflora</i> associated with <i>M. hirsutus</i> ; and <i>Chamaesyce hirta</i> , <i>Sida galheirensis</i> and <i>Sidastrum micranthum</i> with <i>P. solenopsis</i>). In a pest integrated management program, these host plants need to be adequately controlled to avoid the re-infestation of commercial orchards."
	Ambrozevicius, L. P., Calegario, R. F., Fontes, E. P., Carvalho, M. G., & Zerbini, F. M. (2002). Genetic diversity of begomovirus infecting tomato and associated weeds in Southeastern Brazil. <i>Fitopatologia Brasileira</i> , 27, 372-377	[Identified as a weed and possible host of a virus affecting tomato plants] "Among the PCR-positive samples, 35 tomato samples were selected for the phylogenetic analysis, 15 from MG, 8 from ES, 12 from RJ, plus three different weed samples: <i>Sidastrum micranthum</i> Baker, <i>Blainvillea rhomboidea</i> Cass. and wild common bean (<i>Phaseolus vulgaris</i> L.)"
	Seliger, R., Sattler, D., Soares da Silva, A., Costa, G. C. P. D., & Heinrich, J. (2019). Rehabilitation of degraded sloped pastures: lessons learned in Itaocara, Rio de Janeiro. In <i>Strategies and Tools for a Sustainable Rural Rio de Janeiro</i> (pp. 391-404). Springer, Cham	[Identified as a weed of degraded pastures] "As pastures are man-made landscapes, initial vegetation cover is mostly man-made too. The majority of pastures in Southeast Brazil are not directly converted (cleared) Atlantic Forest areas but abandoned former sugarcane or coffee plantations. African fodder grasses such as a wide variety of <i>Brachiaria</i> species and hybrids, <i>Panicum</i> spp., <i>Pennisetum purpureum</i> Schumach. and <i>Melinis minutiflora</i> P. Beauv., are the main pasture grasses, occasionally planted together with native <i>Paspalum maritimum</i> Trin. Along with the sown pasture grasses, a more or less typical set of accompanying weeds such as <i>Desmodium incanum</i> (Sw.) DC, <i>Sida spinosa</i> L., <i>Mimosa pudica</i> L., <i>Sidastrum micranthum</i> (A. St.-Hil.) Fryxell and <i>Crotalaria</i> spp. can be found especially in the dryer, sloped pastures of Southeast Brazil."
	Lorence, D. H., & Flynn, T. (2006). New naturalized plant records for Kaua 'i and Hawai 'i. <i>Bishop Museum Occasional Papers</i> , 88, 1-5	[Pasture weed] "Mähä'ulepü, in pasture lands behind Haula Aweoweonui. "Wetland" depression, ca 80 ft [26 m],"

304	Environmental weed	
	Source(s)	Notes
	Oppenheimer, H. (2008). New Hawaiian plant records for 2007. <i>Bishop Museum Occasional Papers</i> 100: 22-38	"WSW of Pu'u Mähana, uncommon in remnant dry forest" [Potentially impacts native dry forest ecosystems, although effects have not been quantified]

Qsn #	Question	Answer
305	Congeneric weed	
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[<i>Sidastrum paniculatum</i> potentially weedy. Impacts unspecified] "Native to the New World tropics and sUbtropics, the Caribbean, and the Galapagos and Marquesas Islands; in Hawai'i reported as naturalized and common in fields and disturbed sites at Halawa, Hawai'i (Degener, 1934h)."

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[No evidence] "Herbs or shrubs 1-3 m tall, densely yellowish stellate pubescent. Leaf blades ovate to broadly ovate, 5-15 cm long, becoming progressively smaller and narrower in the inflorescence, apex acute, base shallowly cordate, petioles shorter than blades. Flowers in narrow panicles, axillary racemes, or glomerules; calyx 1.8 -2.5 mm long; corolla pale yellow to orange, rotate, petals 2-3 mm long; staminal column ca. 3 mm long; anthers 6-12. Mericarps' 5, pale brown, 1.6-2 mm long, striate-reticulate laterally, without apical beaks, stellate pubescent dorso-apically. Seeds reddish brown, ca. 1.3 mm long, glabrous."

402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	Unknown

403	Parasitic	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Herbs or shrubs 1-3 m tall, densely yellowish stellate pubescent." [Malvaceae. No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes

Qsn #	Question	Answer
	Benício, T. M. A., de Souza, B. B., Silva, A. D. A., Silva, G., & Diniz, F. H. (2011). Ruminal kinetics of native forages and productive performance of Santa Ines lambs fed with malva branca and mata-pasto hays. <i>Revista Verde de Agroecologia e Desenvolvimento Sustentável</i> , 6(4): 106-112	[Potential for use as a hay] "Abstract : This study aimed at evaluates "in situ" ruminal kinetics of hays of some native forages and the productive performance of feedlot Santa Ines lambs fed with malva branca and mata-pasto hays. For the ruminal kinetics were used 5 rams, previously rumen fistulated, to evaluate mata-pasto (<i>Senna obtusifolia</i>), malva preta (<i>Sida micrantha</i>) and malva branca (<i>Sida cordifolia</i>) hays. For the performance, 24 Santa Ines lambs on growth period (10-30 kg) were distributed in a randomized block design, with four treatments (T1 - andrequice hay, as control; T2 - malva branca hay; T3 - mata-pasto hay and T4 - malva branca+mata-pasto hays) with six replicates. It is concluded that malva branca and mata-pasto hays may be included in the diet of sheep, especially in times of food shortages in the semiarid region."
	dos Santos, L. E., et al. (2016). Doses reduzidas de herbicidas hormonais no controle de <i>Sidastrum micranthum</i> . <i>Revista da Universidade Vale do Rio Verde</i> , 14(1), 899-907	[Reduces grazing capacity, suggesting plant is unpalatable or not preferred by livestock] "Na região central do Brasil, esta planta daninha tem provocado redução na capacidade de pastejo dada sua competição por água, luz, nutrientes e principalmente espaço físico nas áreas de pecuária (POTT et al., 2006)." [In central Brazil, this weed has caused a reduction in grazing capacity due to its competition for water, light, nutrients and mainly physical space in livestock areas (POTT et al., 2006).]

405	Toxic to animals	n
	Source(s)	Notes
	Benício, T. M. A., de Souza, B. B., Silva, A. D. A., Silva, G., & Diniz, F. H. (2011). Ruminal kinetics of native forages and productive performance of Santa Ines lambs fed with malva branca and mata-pasto hays. <i>Revista Verde de Agroecologia e Desenvolvimento Sustentável</i> , 6(4): 106-112	[No evidence. Potential for use as a hay] "Abstract: This study aimed at evaluates "in situ" ruminal kinetics of hays of some native forages and the productive performance of feedlot Santa Ines lambs fed with malva branca and mata-pasto hays. For the ruminal kinetics were used 5 rams, previously rumen fistulated, to evaluate mata-pasto (<i>Senna obtusifolia</i>), malva preta (<i>Sida micrantha</i>) and malva branca (<i>Sida cordifolia</i>) hays. For the performance, 24 Santa Ines lambs on growth period (10-30 kg) were distributed in a randomized block design, with four treatments (T1 - andrequice hay, as control; T2 - malva branca hay; T3 - mata-pasto hay and T4 - malva branca+mata-pasto hays) with six replicates. It is concluded that malva branca and mata-pasto hays may be included in the diet of sheep, especially in times of food shortages in the semiarid region."
	Quattrocchi, U. (2012). <i>CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology</i> . CRC Press, Boca Raton, FL	No evidence

406	Host for recognized pests and pathogens	y
	Source(s)	Notes

Qsn #	Question	Answer
	Tavares, S. S., Ramos-Sobrinho, R., González-Aguilera, J., Lima, G. S. A., Assunção, I. P., & Zerbini, F. M. (2012). Further molecular characterization of weed-associated begomoviruses in Brazil with an emphasis on <i>Sida</i> spp. <i>Planta Daninha</i> , 30, 305-315	"Our findings indicate that <i>Sida</i> spp. (including the synonym <i>Sidastrum micranthum</i>) are natural reservoirs of several begomoviruses in Brazil, similarly to what has been observed in Central America and the Caribbean (Frischmuth et al., 1997; Hofer et al., 1997; Roye et al., 1997; Echemendía et al., 2004; Fiallo-Olive et al., 2010; Fiallo-Olivé et al., 2011). However, the true role of these species in the epidemiology of begomovirus diseases in crop plants is still unclear."
	Lopes, F. S. C., Oliveira, J. V. D., Oliveira, J. E. D. M., Oliveira, M. D. D., & Souza, A. M. D. (2019). Host plants for mealybugs (Hemiptera: Pseudococcidae) in grapevine crops. <i>Pesquisa Agropecuária Tropical</i> , 49: e54421	[Identified as a weed and host of mealybug in grapevine crops] "For <i>P. solenopsis</i> , from 16 identified plants, 10 are new records of host plants for this species (García Morales et al. 2016): <i>Chamaesyce hirta</i> , <i>Chenopodium ambrosioides</i> , <i>Commelina</i> sp., <i>D. horizontalis</i> , <i>S. cordifolia</i> , <i>S. galheirensis</i> , <i>Sidastrum micranthum</i> , <i>Sidastrum</i> sp., <i>T. paniculatum</i> and <i>Waltheria douradinha</i> ." ... "These plants belong mainly to the Malvaceae, Euphorbiaceae and Fabaceae families, and most of them are recorded here for the first time in association with mealybugs (e.g., <i>Herissanthia crispa</i> , <i>Jatropha urens</i> and <i>Mimosa tenuiflora</i> associated with <i>M. hirsutus</i> ; and <i>Chamaesyce hirta</i> , <i>Sida galheirensis</i> and <i>Sidastrum micranthum</i> with <i>P. solenopsis</i>). In a pest integrated management program, these host plants need to be adequately controlled to avoid the re-infestation of commercial orchards."
	Ambrozevicius, L. P., Calegario, R. F., Fontes, E. P., Carvalho, M. G., & Zerbini, F. M. (2002). Genetic diversity of begomovirus infecting tomato and associated weeds in Southeastern Brazil. <i>Fitopatologia Brasileira</i> , 27, 372-377	[Identified as a weed and possible host of a virus affecting tomato plants] "Among the PCR-positive samples, 35 tomato samples were selected for the phylogenetic analysis, 15 from MG, 8 from ES, 12 from RJ, plus three different weed samples: <i>Sidastrum micranthum</i> Baker, <i>Blainvillea rhomboidea</i> Cass. and wild common bean (<i>Phaseolus vulgaris</i> L.)"

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Agra, M. D. F., Baracho, G. S., Nurit, K., Basílio, I. J. L. D., & Coelho, V. P. M. (2007). Medicinal and poisonous diversity of the flora of "Cariri Paraibano", Brazil. <i>Journal of ethnopharmacology</i> , 111(2), 383-395	"Table 1. Plants names with medicinal indication, part (s) used and form of way of administration in the "Cariri Paraibano", Brazil" [<i>Sidastrum micranthum</i> - Medicinal indication = Against bronchitis, coughs and asthmas]
	Quattrocchi, U. (2012). <i>CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology</i> . CRC Press, Boca Raton, FL	No evidence

408	Creates a fire hazard in natural ecosystems	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	A weed of pastures. Contribution to fuel load, and overall fire risk, relative to pasture grasses and other fine fuels is unknown.

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	Notes

Qsn #	Question	Answer
	Amaral, L. A., Pereira, I. M., Silva, M. A. P. D., Oliveira, M. L. R. D., Machado, E. L. M., & Laia, M. L. D. (2017). Use of topsoil for restoration of a degraded pasture area. <i>Pesquisa Agropecuária Brasileira</i> , 52, 1080-1090	"Table 3. List of herbaceous, shrub, and subshrub species observed in treatments in the experimental area of Passa Sete farm, in the municipality of Conceição do Mato Dentro, in the state of Minas Gerais, Brazil(1)." [<i>Sidastrum micranthum</i> established in areas with shading]

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	
	Source(s)	Notes
	Oppenheimer, H. (2008). New Hawaiian plant records for 2007. <i>Bishop Museum Occasional Papers</i> 100: 22-38	"Naturalized on O'ahu, Moloka'i, East Maui, and Hawai'i (Wagner et al. 1999a: 901; Starr et al. 2003: 28; Oppenheimer 2007: 27), this species has been recently collected on Lāna'i." [Unknown, but soil type does not appear to be a limiting factor to naturalization]

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). <i>Manual of the flowering plants of Hawaii</i> . Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Herbs or shrubs 1-3 m tall, densely yellowish stellate pubescent."

412	Forms dense thickets	
	Source(s)	Notes
	Rudge, A. D. C. (2008). Contribuição da chuva de sementes na recuperação de áreas e do uso de poleiros como técnica catalisadora da sucessão natural. MS Thesis. Universidade Federal Rural do Rio de Janeiro (UFRRJ), Seropédica	[Dominates degraded areas] "As áreas de recuperação e o fragmento distam 7 km entre si, sendo a matriz ambiental formada por área degradada dominada por <i>Brachiaria decumbens</i> e <i>Sidastrum micranthum</i> ." [Translation: The recovery areas and the fragment are 7 km from each other, with the environmental matrix formed by a degraded area dominated by <i>Brachiaria decumbens</i> and <i>Sidastrum micranthum</i> .]

501	Aquatic	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). <i>Manual of the flowering plants of Hawaii</i> . Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Terrestrial] "Herbs or shrubs 1-3 m tall, densely yellowish stellate pubescent." ... "in Hawai'i naturalized in pastures of Makaleha Valley, O'ahu, and Ka'awaloa, Hawai'i."

Qsn #	Question	Answer
502	Grass	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2022). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 29 Jun 2022]	Family: Malvaceae Subfamily: Malvoideae Tribe: Malveae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2022). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 29 Jun 2022]	Family: Malvaceae Subfamily: Malvoideae Tribe: Malveae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Fryxell, P. A. (2012). Malvaceae. <i>Flora Mesoamericana</i> , 3 (2): 1-162	"Subshrubs 1-3 m tall, the stems stellate-pubescent."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Shimpale, V. B., Sutar, S. P., & Yadav, S. R. (2009). <i>Sidastrum</i> (Malvaceae): A new genus record for Asia. <i>Rheedea</i> , 19(1/2), 50-52	"Distribution: Brazil, Colombia, Costa Rica, Cuba, Guiana and Venezuela; now in India." [No evidence]

602	Produces viable seed	y
	Source(s)	Notes
	Shimpale, V. B., Sutar, S. P., & Yadav, S. R. (2009). <i>Sidastrum</i> (Malvaceae): A new genus record for Asia. <i>Rheedea</i> , 19(1/2), 50-52	"Seed ovoid, 1.4 – 1.6 x 1.0 – 1.2 mm, trigonous, glabrous, blackish." ... "The occurrence of this species in the vicinity of Kolhapur Railway station in a small population suggests that it is probably a recent introduction through imported seeds or food grains."
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). <i>Manual of the flowering plants of Hawaii</i> . Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Seeds reddish brown, ca. 1.3 mm long, glabrous."

Qsn #	Question	Answer
603	Hybridizes naturally	
	Source(s)	Notes
	Fryxell, P. A. (2012). Malvaceae. Flora Mesoamericana, 3 (2): 1-162	Unknown. No evidence

604	Self-compatible or apomictic	
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Flowers in narrow panicles, axillary racemes, or glomerules; calyx 1.8-2.5 mm long; corolla pale yellow to orange, rotate, petals 2-3 mm long; staminal column ca. 3 mm long; anthers 6-12." [Unknown, but given perfect flowers, and ability to naturalize, probably self-fertile]

605	Requires specialist pollinators	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	Flowers in narrow panicles, axillary racemes, or glomerules; calyx 1.8-2.5 mm long; corolla pale yellow to orange, rotate, petals 2-3 mm long; staminal column ca. 3 mm long; anthers 6-12. "
	Alves-dos-Santos, I. (1999). Abelhas e plantas melíferas da Mata Atlântica, restinga e dunas de Litoral norte do Estado do Rio Grande do Sul, Brasil. Revista Brasileira de Entomologia 43(3/4): 191-223	Identified among a list of Bee and honey plants

606	Reproduction by vegetative fragmentation	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	Unknown. Reproduction by seed has been documented

607	Minimum generative time (years)	
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Herbs or shrubs 1-3 m tall, densely yellowish stellate pubescent." [Unknown. Probably 1-2 years]

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y
	Source(s)	Notes
	Starr, F., Starr, K.& Loope, L.L. (2003). New plant records from the Hawaiian Archipelago. Bishop Museum Occasional Papers 74: 23-34	"E. Maui, Kaupö, widespread along road and in pastures from 200 ft [61 m] to 1000 ft [305 m],"
	Shimpale, V. B., Sutar, S. P., & Yadav, S. R. (2009). <i>Sidastrum</i> (Malvaceae): A new genus record for Asia. <i>Rheedea</i> , 19(1/2), 50-52	"Habitat: Along roadsides."

Qsn #	Question	Answer
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Seeds reddish brown, ca. 1.3 mm long, glabrous." [Small seed size, and occurrence along roads, suggests seeds are transported in soil attached to vehicles, machinery, or footwear]
	Pordeus, S.M. Pinto, S. M. P. (2016). Estudo taxonômico e síndromes de dispersão de Malvoideae burnett (Malvaceae) no agreste paraibano, Nordeste do Brasil. MS Thesis. Universidade Estadual da Paraíba, Campina Grande	"Tabela 2. Espécies de Malvoideae e respectivos tipos de síndromes de dispersão, mesorregião Agreste, Estado da Paraíba, Brasil." [Sidastrum micranthum - type of dispersion = Autocórica. autochoric: spontaneous explosion of the fruit]

702	Propagules dispersed intentionally by people	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"in Hawai'i naturalized in pastures of Makaleha Valley, O'ahu, and Ka'awaloa, Hawai'i. First observed at Ka'awaloa about 1900 and collected in 1948" [An apparently accidental introduction, No evidence of intentional cultivation]

703	Propagules likely to disperse as a produce contaminant	y
	Source(s)	Notes
	Wang, Q. L., Lin, G. X., Deng, Y. F., Wang, Z. N., & Yan, X. X. (2017). <i>Sidastrum Baker f.</i> (Malvaceae), A Newly Recorded Genus from China. <i>Journal of Tropical and Subtropical Botany</i> , 25(2), 179-181	"In China, this species was found in the open, wasted land near the coast, and it is probably a recent introduction through imported seeds or food grains"
	Shimpale, V. B., Sutar, S. P., & Yadav, S. R. (2009). <i>Sidastrum</i> (Malvaceae): A new genus record for Asia. <i>Rheedea</i> , 19(1/2), 50-52	"The occurrence of this species in the vicinity of Kolhapur Railway station in a small population suggests that it is probably a recent introduction through imported seeds or food grains."

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Pordeus, S.M. Pinto, S. M. P. (2016). Estudo taxonômico e síndromes de dispersão de Malvoideae burnett (Malvaceae) no agreste paraibano, Nordeste do Brasil. MS Thesis. Universidade Estadual da Paraíba, Campina Grande	"Tabela 2. Espécies de Malvoideae e respectivos tipos de síndromes de dispersão, mesorregião Agreste, Estado da Paraíba, Brasil." [Sidastrum micranthum - type of dispersion = Autocórica. autochoric: spontaneous explosion of the fruit]

705	Propagules water dispersed	
	Source(s)	Notes
	Pordeus, S.M. Pinto, S. M. P. (2016). Estudo taxonômico e síndromes de dispersão de Malvoideae burnett (Malvaceae) no agreste paraibano, Nordeste do Brasil. MS Thesis. Universidade Estadual da Paraíba, Campina Grande	"Tabela 2. Espécies de Malvoideae e respectivos tipos de síndromes de dispersão, mesorregião Agreste, Estado da Paraíba, Brasil." [Sidastrum micranthum - type of dispersion = Autocórica. autochoric: spontaneous explosion of the fruit]
	WRA Specialist. (2022). Personal Communication	Possibly some secondary dispersal by water if growing in riparian areas

Qsn #	Question	Answer
706	Propagules bird dispersed	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Mericarps 5, pale brown, 1.6-2 mm long, striate-reticulate laterally, without apical beaks, stellate pubescent dorso-apically. Seeds reddish brown, ca. 1.3 mm long, glabrous."
	Pordeus, S.M. Pinto, S. M. P. (2016). Estudo taxonômico e síndromes de dispersão de Malvoideae burnett (Malvaceae) no agreste paraibano, Nordeste do Brasil. MS Thesis. Universidade Estadual da Paraíba, Campina Grande	"Tabela 2. Espécies de Malvoideae e respectivos tipos de síndromes de dispersão, mesorregião Agreste, Estado da Paraíba, Brasil." [Sidastrum micranthum - type of dispersion = Autocórica. autochoric: spontaneous explosion of the fruit]

707	Propagules dispersed by other animals (externally)	
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Seeds reddish brown, ca. 1.3 mm long, glabrous. [2n = 32.] Widespread in South America, the Caribbean, and Central America; in Hawai'i naturalized in pastures" [Presence in pastures suggests small seeds could adhere to animals in fur or mud]

708	Propagules survive passage through the gut	n
	Source(s)	Notes
	Pordeus, S.M. Pinto, S. M. P. (2016). Estudo taxonômico e síndromes de dispersão de Malvoideae burnett (Malvaceae) no agreste paraibano, Nordeste do Brasil. MS Thesis. Universidade Estadual da Paraíba, Campina Grande	"Tabela 2. Espécies de Malvoideae e respectivos tipos de síndromes de dispersão, mesorregião Agreste, Estado da Paraíba, Brasil." [Sidastrum micranthum - type of dispersion = Autocórica. autochoric: spontaneous explosion of the fruit]

801	Prolific seed production (>1000/m2)	
	Source(s)	Notes
	Pachêco, B. S., de Albuquerque, L. B., Claros, M., & Gerais, M. (2014). Chuva de sementes como indicador de restauração ecológica em matas ripárias do Distrito Federal. MS Thesis. Universidade Estadual de Montes Claros, Montes Claros, Minas Gerais	"ANEXO 2 Tabela 2: Diásporos coletados na área do Rio Jardim (Distrito Federal) identificados ao menor nível taxonômico possível, juntamente com o grupo de dispersão, tipo de diásporo, tamanho (mm) e quantidade total de diásporos para cada morfo coletada. Siglas: NA: não- anemocórica, A: anemocórica, S: Semente, F: Fruto." [Sidastrum micranthum - Total number of diaspores = 3226]
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Seeds reddish brown, ca. 1.3 mm long, glabrous." [Possibly. Small-seeded]

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes

Qsn #	Question	Answer
	Guimarães, S., Martins, S. V., Neri, A. V., Gleriani, J. M., & de Almeida Silva, K. (2014). Banco de sementes de áreas em restauração florestal em Aimorés, MG. Pesquisa Florestal Brasileira, 34(80), 357-368	"Tabela 2. Espécies amostradas no banco de sementes do solo das quatro áreas da RPPN – Fazenda Bulcão, Aimorés, MG." [Translation: Table 2. Species sampled in the soil seed bank of the four areas of the RPPN – Bulcão Farm, Aimorés, MG. <i>Sidastrum micranthum</i> collected in seed bank. Longevity unspecified]

803	Well controlled by herbicides	Y
	Source(s)	Notes
	dos Santos, L. E., et al. (2016). Doses reduzidas de herbicidas hormonais no controle de <i>Sidastrum micranthum</i> . Revista da Universidade Vale do Rio Verde, 14(1), 899-907	"ABSTRACT: The success of Brazilian livestock production is closely related to the proper maintenance of pastures. Pastures degraded by the presence of weeds are up currently, one of the biggest problems of this sector, reducing the yield and quality of forage. The aim of this study was to investigate the action of sublethal herbicide to control of <i>Sidastrum micranthum</i> in pasture. The experimental design was a randomized block design with three replications and 10 treatments arranged in a factorial (2 x 5), and 2 herbicides applied in 5 doses, 2,4-D and formulation of 2,4-D+picloram at doses from: 0, 3, 6, 12.5 and 25% of the recommended dose for weed control in perennial crops (4,0 L ha ⁻¹). We evaluated control in <i>S. micranthum</i> and determination of plant height at 7, 14, 21 and 28 DAA (days after application) and phytointoxication in <i>Brachiaria</i> grass in the same evaluations. There was no symptom of phytointoxication forage. Control less than 90% mallow was found from dose 12.5% of the recommended dose of 2,4-D+picloram and 25% of 2,4-D. The herbicides used were efficient in controlling weed species at lower doses than recommended for species difficult to control."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	Unknown

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	Oppenheimer, H. (2008). New Hawaiian plant records for 2007. Bishop Museum Occasional Papers 100: 22-38	"Naturalized on O'ahu, Moloka'i, East Maui, and Hawai'i (Wagner et al. 1999a: 901; Starr et al. 2003: 28; Oppenheimer 2007: 27), this species has been recently collected on Lāna'i." [Unknown, but able to naturalize on multiple Hawaiian islands]

Summary of Risk Traits:

High Risk / Undesirable Traits

- Thrives and spreads in regions with tropical climates
- Naturalized on Kauai, Oahu, Molokai, Lanai, Maui and Hawaii (Hawaiian Islands) and elsewhere in the tropics
- A common weed of pastures, reported to compete with desirable forage plants and to reduce grazing capacity
- Prevalence in pastures suggests that plants may be unpalatable relative to other pasture plants
- Host of crop pests and pathogens
- Tolerates shade
- Reproduces by seeds
- Seeds dispersed autochorously (by dehiscent capsules), along heavily trafficked corridors, and as a seed contaminant
- Gaps in biological and ecological information may reduce accuracy of risk prediction

Low Risk Traits

- Unarmed (no spines, thorns, or burrs)
- Non-toxic
- Herbicides may provide effective control