

Assessment date 4 February 2016

<i>Alternanthera brasilianas</i> ALL ZONES		Answer	Score
1.01	Is the species highly domesticated?	n	0
1.02	Has the species become naturalised where grown?		
1.03	Does the species have weedy races?		
2.01	Species suited to Florida's USDA climate zones (0-low; 1-intermediate; 2-high) North Zone: suited to Zones 8, 9 Central Zone: suited to Zones 9, 10 South Zone: suited to Zone 10	2	
2.02	Quality of climate match data (0-low; 1-intermediate; 2-high)	2	
2.03	Broad climate suitability (environmental versatility)	y	1
2.04	Native or naturalized in habitats with periodic inundation North Zone: mean annual precipitation 50-70 inches Central Zone: mean annual precipitation 40-60 inches South Zone: mean annual precipitation 40-60 inches	y	1
2.05	Does the species have a history of repeated introductions outside its natural range?	y	
3.01	Naturalized beyond native range	y	2
3.02	Garden/amenity/disturbance weed	y	2
3.03	Weed of agriculture	y	4
3.04	Environmental weed	y	4
3.05	Congeneric weed	y	2
4.01	Produces spines, thorns or burrs	n	0
4.02	Allelopathic	unk	0
4.03	Parasitic	n	0
4.04	Unpalatable to grazing animals	n	-1
4.05	Toxic to animals	n	0
4.06	Host for recognised pests and pathogens	unk	0
4.07	Causes allergies or is otherwise toxic to humans	n	0
4.08	Creates a fire hazard in natural ecosystems	unk	0
4.09	Is a shade tolerant plant at some stage of its life cycle	n	0
4.10	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils). North & Central Zones: infertile soils; South Zone: shallow limerock or Histisols.	unk	0
4.11	Climbing or smothering growth habit	y	1
4.12	Forms dense thickets	y	1
5.01	Aquatic	n	0
5.02	Grass	n	0
5.03	Nitrogen fixing woody plant	n	0
5.04	Geophyte	n	0
6.01	Evidence of substantial reproductive failure in native habitat	n	0
6.02	Produces viable seed	y	1

6.03	Hybridizes naturally	unk	-1
6.04	Self-compatible or apomictic	unk	-1
6.05	Requires specialist pollinators	n	0
6.06	Reproduction by vegetative propagation	y	1
6.07	Minimum generative time (years)	unk	-1
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y	1
7.02	Propagules dispersed intentionally by people	y	1
7.03	Propagules likely to disperse as a produce contaminant	n	-1
7.04	Propagules adapted to wind dispersal	unk	-1
7.05	Propagules water dispersed	y	1
7.06	Propagules bird dispersed	unk	-1
7.07	Propagules dispersed by other animals (externally)	unk	-1
7.08	Propagules dispersed by other animals (internally)	unk	-1
8.01	Prolific seed production	unk	-1
8.02	Evidence that a persistent propagule bank is formed (>1 yr)	unk	-1
8.03	Well controlled by herbicides	unk	1
8.04	Tolerates, or benefits from, mutilation or cultivation	unk	-1
8.05		?	
Total Score		12	
Implemented Pacific Second Screening		no	
Risk Assessment Results		High	

section	# questions answered	satisfy minimum?
A		11 yes
B		8 yes
C		12 yes
total		31 yes

	Reference	Source data
1.01		Cultivated but no evidence of selection for reduced weediness
1.02		Skip to question 2.01
1.03		Skip to question 2.01
2.01	1. PERAL NAPPFAST Global Plant Hardiness. http://www.nappfast.org/Plant_hardiness/2012/PHZ%20update201230%20yr%20%20300dpi.tif (Accessed: 30 October 2015) 2. USDA Germplasm Resources Information Network. http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?101485 (Accessed: 19 November 2015)	No computer analysis was performed. 1. Florida North Zone: Hardiness zones 8 and 9. Central Zone: Hardiness zones 9 and 10. South Zone: Hardiness zone 10. Present in Zones 8-13. 2. Native to Mexico, Barbados, Dominica, Grenada, Guadeloupe, Martinique, Montserrat, St. Lucia, St. Vincent and Grenadines, Belize, Guatemala, Nicaragua, French Guiana, Guyana, Suriname, Venezuela, Brazil, Colombia, Ecuador, and Peru
2.02		
2.03	1. The University of Melbourne. Köppen-Geiger Climate Map of the World. http://people.eng.unimelb.edu.au/mpeel/koppen.html (Accessed: 19 November 2015) 2. USDA Germplasm Resources Information Network. http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?101485 (Accessed: 19 November 2015)	1. Present in Köppen-Geiger climate zones: Af, Am, Aw, BWh, BWk, BSh, BSk, Csa, Csb, Cwa, Cwb, Cfa, and Cfb. 2. Native to Mexico, Barbados, Dominica, Grenada, Guadeloupe, Martinique, Montserrat, St. Lucia, St. Vincent and Grenadines, Belize, Guatemala, Nicaragua, French Guiana, Guyana, Suriname, Venezuela, Brazil, Colombia, Ecuador, and Peru
2.04	1. Climate Charts. World Climate Maps. http://www.climate-charts.com/World-Climate-Maps.html#rain (Accessed: 19 November 2015) 2. USDA Germplasm Resources Information Network. http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?101485 (Accessed: 19 November 2015)	1. Present in areas with rainfall within these ranges. 2. Native to Mexico, Barbados, Dominica, Grenada, Guadeloupe, Martinique, Montserrat, St. Lucia, St. Vincent and Grenadines, Belize, Guatemala, Nicaragua, French Guiana, Guyana, Suriname, Venezuela, Brazil, Colombia, Ecuador, and Peru
2.05	1. Padua, Bunyapraphatsara, and Lemmens, eds. (1999) Plant Resources of South-East Asia. No. 12. Medicinal and poisonous plants 1. Backhuys Publishers, Leiden. 2. Whistler (2000) Tropical Ornamentals: a Guide. Timber Press, Portland. 3. IT IS Report. http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=20765 (Accessed: 2 December 2015) 4. Pacific Island Ecosystems at Risk. http://www.hear.org/pier/species/alternanthera_brasiliana.htm (Accessed: 2 December 2015)	1. "Native of tropical America; introduced and naturalized in western and central Java." 2. "cultivated for its dark purple foliage and white heads" 3. "Hawaii, Introduced; Caribbean Territories, Introduced; Continental US, Introduced" 3. Introduced in Cook Islands, Micronesia, French Polynesia, Hawaii, Marshall Islands, Niue, Palau, Pitcarin Islands, and Wallis and Futuna.
3.01	1. Padua, Bunyapraphatsara, and Lemmens, eds. (1999) Plant Resources of South-East Asia. No. 12. Medicinal and poisonous plants 1. Backhuys Publishers, Leiden. 2. Wagner, Herbst, and Sohmer (1999) Manual of the flowering plants of Hawai'i. University of Hawai'i Press/Bishop Museum Press, Honolulu. 3. Weeds of Australia. Queensland Government. http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a8d04-0605030c0f01/media/Html/Alternanthera_brasiliana.htm (Accessed: 2 December 2015)	1. "Native of tropical America; introduced and naturalized in western and central Java." 2. "appears to be naturalized" in Hawaii 3. "Purple joyweed (<i>Alternanthera brasiliana</i>) is becoming widely naturalised in the coastal districts of northern and eastern Australia. It is relatively common in northern Queensland and the northern parts of the Northern Territory. Also naturalised in the coastal districts of central and southern Queensland and in the Kimberley region in northern Western Australia. Naturalised overseas in south-eastern USA (i.e. Florida), South Africa and on some Pacific islands (e.g. Hawaii, Niue and Palau)."
3.02	1. Global Compendium of Weeds. http://www.hear.org/gcw/species/alternanthera_brasiliana/ (Accessed: 2 December 2015) 2. Brisbane City Council. Weed Identification Tool. http://weeds.brisbane.qld.gov.au/weeds/purple-joyweed (Accessed: 4 December 2015) 3. Torres Strait Regional Authority. http://www.tsra.gov.au/__data/assets/pdf_file/0005/4496/lama_Island_Biodiversity_January_2013.pdf (Accessed: 4 December 2015)	1. Listed as a garden thug and a weed 2. "A weed of roadsides, disturbed sites, waste areas, footpaths, lawns, mown areas, riparian vegetation, open woodlands and forest margins."

3.03	1. Padua, Bunyaphatsara, and Lemmens, eds. (1999) Plant Resources of South-East Asia. No. 12. Medicinal and poisonous plants 1. Backhuys Publishers, Leiden.	1. <i>A. brasiliana</i> is a weed of coffee in SE Asia.
3.04	1. Global Compendium of Weeds. http://www.hear.org/gcw/species/alternanthera_brasiliana/ (Accessed: 2 December 2015) 2. Weeds of Australia. Queensland Government. http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Alternanthera_brasiliana.htm (Accessed: 3 December 2015)	1. Listed as an environmental weed 2. "Purple joyweed (<i>Alternanthera brasiliana</i>) is now regarded as an environmental weed in Queensland and the Northern Territory." 3. "Other species with potential to invade include yellow bells (<i>Tecoma stans</i>), Brazilian joyweed (<i>Alternanthera brasiliana</i> cv. <i>Rubiginosa</i> *), Poinciana (<i>Delonix regia</i> *) and butterfly pea (<i>Clitoria ternatea</i> *) other weed species. These species have potential to significantly alter habitat ecology, altering shrub and ground layer diversity as well as facilitation fire incursion."
3.05	1. Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York. 2. Global Comendium of Weeds. http://www.hear.org/gcw/scientificnames/scinamea.htm (Accessed: 2 December 2015) 3. Holm, Pancho, Herberger, and Plucknett (1991) A Geographical Atlas of World Weeds. Krieger Publishing Company, Malabar. (Accessed: 2 December 2015)	1. <i>A. philoxeroides</i> is reported as a weed in 30 countries, and <i>A. sessilis</i> in more than 65 countries. 2. <i>A. bettzickiana</i> is listed as an environmental weed, <i>A. denata</i> is listed as an agricultural weed and environmental weed, <i>A. ficoidea</i> is listed as an agricultural weed and environmental weed, <i>A. lanceolata</i> is listed as an environmental weed, <i>A. nodiflora</i> is listed as an agricultural weed, <i>A. paronichyoides</i> is listed as an agricultural weed, <i>A. philoxeroides</i> is listed as an agricultural weed, environmental weed, and noxious weed, <i>A. polygonoides</i> is listed as an agricultural weed, <i>A. pungens</i> is listed as an agricultural weed, environmental weed, and noxious weed, and <i>A. sessilis</i> is listed as an agricultural weed, environmental weed, and noxious weed. 3. <i>A. nodiflora</i> listed as a principal weed of Taiwan, <i>A. philoxeroides</i> is listed as a serious weed in the US and Argentina and a principal weed of New Zealand and Taiwan, and <i>A. sessilis</i> is listed as a serious weed of Ghana, Ivory Coast, Mozambique, Nigeria, Philippines, and Thailand and a principal weed of Indonesia, India, Malaysia, and Thailand.
4.01	1. Pacific Island Ecosystems at Risk. http://www.hear.org/pier/species/alternanthera_brasiliana.htm (Accessed: 3 December 2015) 2. Pelagia Research Library. http://pelagiaresearchlibrary.com/asian-journal-of-plant-science/vol1-iss1/AJPSR-2011-1-1-41-47.pdf (Accessed: 4 December 2015) 3. Brisbane City Council. Weed Identification Tool. http://weeds.brisbane.qld.gov.au/weeds/purple-joyweed (Accessed: 4 December 2015)	1,2,&3. These features are not listed in the description of the species
4.02	1. Ibadan Journal of Agricultural Research. http://ijar.ui.edu.ng/index.php/ijar/article/view/32 (Accessed: 4 December 2015)	No evidence that does not rely on concentrated extracts
4.03		No evidence
4.04	1. Lorenzi (2000) Plantas Daninhas do Brasil. Instituto Plantarum. 2. Pelagia Research Library. http://pelagiaresearchlibrary.com/asian-journal-of-plant-science/vol1-iss1/AJPSR-2011-1-1-41-47.pdf (Accessed: 4 December 2015)	1. "It is avidly appreciated by cattle" 2. "It is claimed to be a good fodder which increases milk in cattle."
4.05	1. Lorenzi (2000) Plantas Daninhas do Brasil. Instituto Plantarum. 2. Pelagia Research Library. http://pelagiaresearchlibrary.com/asian-journal-of-plant-science/vol1-iss1/AJPSR-2011-1-1-41-47.pdf (Accessed: 4 December 2015)	1. "It is avidly appreciated by cattle" 2. "It is claimed to be a good fodder which increases milk in cattle."
4.06	1. The Ohio State University. https://kb.osu.edu/dspace/bitstream/handle/1811/62977/OARDC_research_bulletin_n1153.pdf?sequence=1 (Accessed: 4 December 2015)	1. "Other weed species listed as hosts for root-knot nematodes were: <i>Alternanthera brasiliana</i> "; no evidence that this plant is a significant primary or alternate host

4.07	<p>1. Useful Tropical Plants. http://tropical.theferns.info/viewtropical.php?id=Alternanthera+brasiliiana (Accessed: 3 December 2015) 2. Home Design Directory. http://www.homedesigndirectory.com.au/gardening/plant-finder/plant-descriptions/alternanthera-brasiliana/?plant-id=1188 (Accessed: 3 December 2015)</p>	<p>1. "Edible Uses: Leaves - cooked and used as a vegetable" 2. "The leaves are edible, and can be used raw or in soups and stews. They should not be eaten by pregnant women. A poultice of the leaves can be used for boils."</p>
4.08	<p>1. Torres Strait Regional Authority. http://www.tsra.gov.au/__data/assets/pdf_file/0005/4496/lamaIsland_Biodiversity_January_2013.pdf (Accessed: 4 December 2015)</p>	<p>1. "Other species with potential to invade include yellow bells (<i>Tecoma stans</i>), Brazilian joyweed (<i>Alternanthera brasiliana</i> cv. <i>Rubiginosa</i>*), Poinciana (<i>Delonix regia</i>*) and butterfly pea (<i>Clitoria ternatea</i>*) other weed species. These species have potential to significantly alter habitat ecology, altering shrub and ground layer diversity as well as facilitation fire incursion."; insufficient evidence</p>
4.09	<p>1. Padua, Bunyapraphatsara, and Lemmens, eds. (1999) Plant Resources of South-East Asia. No. 12. Medicinal and poisonous plants 1. Backhuys Publishers, Leiden. 2. Whistler (2000) Tropical Ornamentals: a Guide. Timber Press, Portland. 3. Home Design Directory. http://www.homedesigndirectory.com.au/gardening/plant-finder/plant-descriptions/alternanthera-brasiliana/?plant-id=1188 (Accessed: 3 December 2015)</p>	<p>1. "A. brasiliana shows a preference for shaded localities" 2. "partially shaded places are preferred" 3. "Alternanthera likes a part shade to full sun position, but the best colour is developed in the sun."</p>
4.10	<p>1. Flora of North America, vol. 4 (http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242415693). 2. Lorenzi (2000) Plantas Daninhas do Brasil. Instituto Plantarum.</p>	<p>1. "sandy, wet, disturbed sites" BUT 2. "principally in clay soils", insufficient evidence</p>
4.11	<p>1. Brisbane City Council. Weed Identification Tool. http://weeds.brisbane.qld.gov.au/weeds/purple-joyweed (Accessed: 4 December 2015) 2. Torres Strait Regional Authority. http://www.tsra.gov.au/__data/assets/pdf_file/0005/4496/lamaIsland_Biodiversity_January_2013.pdf (Accessed: 4 December 2015)</p>	<p>1. "occasionally climbing over other vegetation " 2. "Brazilian joyweed (<i>Alternanthera brasiliana</i> cv. <i>rubiginosa</i>) is invading vine thickets on rocky slopes on the edge of the community area and is considered a threat to these habitats given its ability to spread by root nodes and survive in low light conditions."</p>
4.12	<p>1. Lorenzi (2000) Plantas Daninhas do Brasil. Instituto Plantarum. 2. Torres Strait Regional Authority. http://www.tsra.gov.au/__data/assets/pdf_file/0005/4496/lamaIsland_Biodiversity_January_2013.pdf (Accessed: 4 December 2015)</p>	<p>1. "forming dense carpets of semi- creeping vegetation" 2. "Brazilian joyweed (<i>Alternanthera brasiliana</i> cv. <i>rubiginosa</i>) is invading vine thickets on rocky slopes on the edge of the community area and is considered a threat to these habitats given its ability to spread by root nodes and survive in low light conditions."</p>
5.01	<p>1. Global Biodiversity Information Facility. http://www.gbif.org/species/3084934 (Accessed: 4 December 2015)</p>	<p>1. "Habitat: Not marine, Terrestrial"</p>
5.02	<p>1. USDA Plants Database. http://plants.usda.gov/core/profile?symbol=albr5 (Accessed: 3 December 2015)</p>	<p>1. "Growth Habit: Forb/herb, Shrub, Vine"</p>
5.03	<p>1. Messages from the Gods: A Guide to the Useful Plants of Belize. https://books.google.com/books?id=A4RMCAAQBAJ&pg=PA169&pg=PA169&dq=%22Alternanthera+brasiliiana%22+%22woody%22&source=bl&ots=iXGcrlYHTQ&sig=EebYReAVq8J0qldE8D3MK5P9Pfo&hl=en&sa=X&ved=0ahUKEWj6qsbN9sLJAhUEXB4KHVnoAtQQ6AEISjAJ#v=onepage&q=%22Alternanthera%20brasiliiana%22%20%22woody%22&f=false (Accessed: 4 December 2015)</p>	<p>1. "Herbs, sometimes a semi-woody vine"</p>
5.04	<p>1. Pacific Island Ecosystems at Risk. http://www.hear.org/pier/species/alternanthera_brasiliana.htm (Accessed: 3 December 2015) 2. Pelagia Research Library. http://pelagiaresearchlibrary.com/asian-journal-of-plant-science/vol1-iss1/AJPSR-2011-1-1-41-47.pdf (Accessed: 4 December 2015) 3. Brisbane City Council. Weed Identification Tool. http://weeds.brisbane.qld.gov.au/weeds/purple-joyweed (Accessed: 4 December 2015)</p>	<p>1,2,&3. These features are not listed in the description of the species</p>

6.01		No evidence
6.02	1. Lorenzi (2000) Plantas Daninhas do Brasil. Instituto Plantarum. 2. Whistler (2000) Tropical Ornamentals: a Guide. Timber Press, Portland. 3. Brisbane City Council. Weed Identification Tool. http://weeds.brisbane.qld.gov.au/weeds/purple-joyweed (Accessed: 4 December 2015)	1. reproduction is by seeds 2. propagate by seeds 3. "This species reproduces by seed and also vegetatively"
6.03		No evidence
6.04	1. Learn2Grow. http://www.learn2grow.com/plants/alternanthera-brasiliana/ (Accessed: 4 December 2015) 2. Useful Tropical Plants. http://tropical.theferns.info/viewtropical.php?id=Alternanthera+brasiliiana (Accessed: 4 December 2015)	1. "Self-Sowing: Yes" 2. "The plant often self-seeds in the garden and can become weedy"
6.05	1. Hal Archives Ouvertes. https://hal.archives-ouvertes.fr/hal-00892070/document (Accessed: 9 December 2015)	1. Visited by social bees and wasps.
6.06	1. PIER, Institute of Pacific Islands Forestry (http://www.hear.org/pier/species/alternanthera_brasiliana.htm). 2. News Mail. http://www.news-mail.com.au/news/purple-weed-brings-no-joy/2672166/ (Accessed: 3 December 2015)	1. propagation: seed and vegetatively 2. "It roots at the nodes on the spreading branches where it comes in contact with the ground."
6.07		No evidence
7.01	1. PIER, Institute of Pacific Islands Forestry (http://www.hear.org/pier/species/alternanthera_brasiliana.htm). 2. Brisbane City Council. Weed Identification Tool. http://weeds.brisbane.qld.gov.au/weeds/purple-joyweed (Accessed: 4 December 2015)	1. "Can spread through discarded cuttings." 2. "Stem segments and seeds may also be spread by water, mowers, and in dumped garden waste."
7.02	1. Whistler (2000) Tropical Ornamentals: a Guide. Timber Press, Portland. 2. Weeds of Australia. Queensland Government. http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Alternanthera_brasiliana.htm (Accessed: 3 December 2015)	1. "cultivated for its dark purple foliage and white heads" 2. "This species is very common in cultivation as a garden ornamental and is often grown as a hedging plant."
7.03		No evidence
7.04	1. Whistler (2000) Tropical Ornamentals: a Guide. Timber Press, Portland.	1. fruit a tiny, one-seeded utricle
7.05	1. Brisbane City Council. Weed Identification Tool. http://weeds.brisbane.qld.gov.au/weeds/purple-joyweed (Accessed: 4 December 2015)	1. "Stem segments and seeds may also be spread by water"
7.06		No evidence
7.07		No evidence
7.08		No evidence
8.01	1. Whistler (2000) Tropical Ornamentals: a Guide. Timber Press, Portland. 2. Brisbane City Council. Weed Identification Tool. http://weeds.brisbane.qld.gov.au/weeds/purple-joyweed (Accessed: 4 December 2015)	1. one seed per fruit 2. "The tiny fruit (i.e. utricle) is oval (i.e. ellipsoid) in shape and 1.5-2 mm long. This fruit turns brown in colour as it matures and does not open (i.e. it is indehiscent). It contains a single seed and usually remains hidden within the old flower parts. The oblong to egg-shaped (i.e. ovoid) seeds are about 1.4 mm long."
8.02	1. Dave's Garden. http://davesgarden.com/guides/pf/go/62291/#b (Accessed: 19 November 2015) 2. Pacific Island Ecosystems at Risk. http://www.hear.org/pier/species/alternanthera_brasiliana.htm (Accessed: 3 December 2015)	1. "Seed does not store well; sow as soon as possible" 2. "The seeds appear to have the ability to remain dormant for a long period"
8.03	1. News Mail. http://www.news-mail.com.au/news/purple-weed-brings-no-joy/2672166/ (Accessed: 3 December 2015)	1. "The use of herbicides are the most effective method of control, because pieces of Alternanthera can break off if hand pulled, or mechanically methods are used."; insufficient evidence
8.04		No evidence
8.05		No evidence