

Assessment date July 20, 2020

<i>Chloris gayana</i> ALL ZONES		Answer	Score
1.01	Is the species highly domesticated?	?	
1.02	Has the species become naturalised where grown?	n	0
1.03	Does the species have weedy races?	y	1
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	1	1
2.02	Quality of climate match data (0-low; 1-intermediate; 2-high)	y	1
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	1
3.01	Naturalized beyond native range	y	1
3.02	Garden/amenity/disturbance weed	n	-1
3.03	Weed of agriculture	y	1
3.04	Environmental weed	unk	-1
3.05	Congeneric weed	y	1
4.01	Produces spines, thorns or burrs	n	-1
4.02	Allelopathic	y	-1
4.03	Parasitic	n	-1
4.04	Unpalatable to grazing animals	?	
4.05	Toxic to animals	n	0
4.06	Host for recognised pests and pathogens	y	1
4.07	Causes allergies or is otherwise toxic to humans	unk	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	n	0
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	y	1
6.05	Requires specialist pollinators	n	0
6.06	Reproduction by vegetative propagation	n	-1
6.07	Minimum generative time (years)	0	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	y	1
7.04	Propagules adapted to wind dispersal	n	-1
7.05	Propagules water dispersed	n	-1
7.06	Propagules bird dispersed	y	1
7.07	Propagules dispersed by other animals (externally)	n	-1
7.08	Propagules dispersed by other animals (internally)	y	1
8.01	Prolific seed production	n	-1
8.02	Evidence that a persistent propagule bank is formed (>1 yr)	n	-1
8.03	Well controlled by herbicides	?	
8.04	Tolerates, or benefits from, mutilation or cultivation	unk	-1
8.05	Effective natural enemies present in U.S.	?	
Total Score			12
Implemented Pacific Second Screening			No
Risk Assessment Results			High

section	# questions answered	satisfy minimum?
A		11 yes
B		11 yes
C		20 yes
total		42 yes

	Reference	Source data
1.01		Cultivated but no evidence of selection for reduced invasive traits.
1.02		skip to 2.01
1.03		skip to 2.02
2.01	https://plants.usda.gov/core/profile?symbol=CHGA2 ; USDA Plant Hardiness zone map http://planthardiness.ars.usda.gov/PHZMWeb/ Accessed 4 September 2018	Hardiness zones 8-10
2.02		no computer analysis was performed. Native range is well known; refer to 2.01 source data
2.03	Koppen-Geiger climate map (http://koeppen-geiger.vu-wien.ac.at/) Accessed 27 August 2018	Distribution in native and cultivated ranges occurs in over 3 climate zones (Cfb, Cfa, Cwb, Csa, Csb). Cfa distribution overlaps with most of Florida.
2.04	Bogdan, A.V. (1961) Intra variety variation in Rhodes grass (<i>Chloris gayana</i> Kunth.) in Kenya. <i>Journal of the British Grassland Society</i> , 16, 238-239.	Rainfall in its natural range varies from about 500-1,500 mm/yr. (19-59 in)
2.05	1. Feedipedia database, https://www.feedipedia.org/node/480 accessed (7/20/2020) 2. CABI, https://www.cabi.org/isc/datasheet/13115#REF-DDB-184853 accessed (7/20/2020)	1. Promoted for forage: "Rhodes grass is primarily a useful forage of moderate to high quality. It is grazed, cut for hay or used as deferred feed" 2. Listed as "introduced in multiple countries including Egypt, China, Spain, and the U.S.
3.01	Duke, J.A. 1979. Ecosystematic data on economic plants. <i>Quart. J. Crude Drug Res.</i> 17(3-4):91-110. 2. CABI, https://www.cabi.org/isc/datasheet/13115#REF-DDB-184853 accessed (7/20/2020)	1. Native to South and East Africa, in areas from 660 to over 2160 m altitudes. It was introduced into India from South Africa, and later into North America (Gulf Coast and California under irrigation), Australia (especially in Queensland), South America (Brazil, Argentina, and Uruguay), North Africa, and Philippine Islands. 2. Listed as Naturalized in Brazil
3.02	Weeds of Australia Biosecurity Edition https://keyserver.lucidcentral.org/weeds/data/media/html/chloris_gayana.htm 29 May 2018	A weed of roadsides, railways, disturbed sites, parks, gardens, footpaths, orchards, vineyards,
3.03	https://hort.purdue.edu/newcrop/duke_energy/Chloris_gayana.html Accessed 4 September 2018	it is easily controlled and seldom becomes a troublesome weed.
3.04	1. https://hort.purdue.edu/newcrop/duke_energy/Chloris_gayana.html Accessed 4 September 2018 2. http://www.herbiguide.com.au/Descriptions/hg_Rhodes_Grass.htm	1. it is easily controlled and seldom becomes a troublesome weed. 2. Minor environmental weed and unlikely to seriously invade natural bushland because it doesn't tolerate shade.
3.05		no evidence
4.01	https://plants.usda.gov/core/profile?symbol=CHGA2	no evidence of these attributes
4.02		no evidence
4.03		no evidence
4.04	https://plants.usda.gov/core/profile?symbol=CHGA2 ; Loch, D.S., Rethman, N.F.G. and van Niekerk, W.A. (2004) Rhodesgrass. In: L.E. Moser, B.L. Burson and L.E. Sollenberger (eds) <i>Warm-Season (C4) Grasses</i> , Agronomy Monograph No. 45. American Society of Agronomy , Crop Science Society of America, Soil Science Society of America, Madison, WI. (in press).	used as forage
4.05		no evidence

4.06	Invasive Species Compendium Chloris gayana fact sheet https://www.cabi.org/isc/datasheet/13115 July 9 2018	"Major host of: Helicotylenchus dihystra (common spiral nematode); Mocis latipes (grass looper); Rotylenchulus parvus (reniform nematode) Minor host of: Amrasca biguttula biguttula (Indian cotton jassid); Meloidogyne acronea (African cotton root nematode); Spodoptera frugiperda (fall armyworm); Spodoptera littoralis (cotton leafworm) Wild host of: Cochliobolus lunatus (head mould of grasses, rice and sorghum); Pratylenchus zeae (root lesion nematode) Host of (source - data mining): Cochliobolus hawaiiensis (leaf spot: maize); Setosphaeria rostrata (leaf spot of grasses)
4.07	Pollen Library http://www.pollenlibrary.com/Specie/Chloris+gayana/ accesses 7/20/2020	Rhodes Grass (Chloris gayana) is a mild allergen.
4.08		no evidence
4.09	Bogdan, A.V. 1969. Rhodes grass. Commonwealth Bureau of Pastures and Field Crops, Hurley, Berkshire, England, Herbage Abstracts 39(1):1-13.	1. Generally poor shade tolerance. 2. Chloris gayana is a full sunlight species which does not grow well under shade
4.10	1. Duke, J.A. 1978. The quest for tolerant germplasm. p. 1-61. In: ASA Special Symposium 32, Crop tolerance to suboptimal land conditions. Am. Soc. Agron. Madison, WI. 2. Feedipedia database, https://www.feedipedia.org/node/480 accessed (7/20/2020)	1. Reported from the African Center of Diversity, Rhodesgrass, or cvs thereof, is reported to tolerate alkali, drought, frost, high pH, low pH, nematodes, poor soil, salt, sand, slope, and weeds 2. Rhodes grass grows on a wide range of soils from poor sandy soils to heavy clayey alkaline and saline soils (more than 10 dS/m). This salt tolerance is particularly valuable in irrigated pastures where it can be cultivated without problem. Rhodes grass does better on fertile, well-structured soils and it prefers soil pH between 5.5 and 7.5. Establishment on acidic soils is difficult
4.11		no evidence of these attributes
4.12		no evidence
5.01	Invasive Species Compendium Chloris gayana fact sheet https://www.cabi.org/isc/datasheet/13115 July 9 2018	terrestrial plant
5.02	https://plants.usda.gov/core/profile?symbol=CHGA2; http://www.hear.org/pier/species/chloris_gayana.htm	Poaceae
5.03		no sign of these traits
5.04		no evidence that this plant produces geophytes
6.01	CABI, https://www.cabi.org/isc/datasheet/13115#REF-DDB-184853 accessed (7/20/2020)	1. rapidly reproduce both by seeds and vegetatively
6.02	1. Loch, D.S., Rethman, N.F.G. and van Niekerk, W.A. (2004) Rhodesgrass. In: L.E. Moser, B.L. Burson and L.E. Sollenberger (eds) Warm-Season (C4) Grasses, Agronomy Monograph No. 45. American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, Madison, WI. , pp 833-871. 2. CABI, https://www.cabi.org/isc/datasheet/13115#REF-DDB-184853 accessed (7/20/2020)	"Produces large amount of seeds" "Header harvested yields of 100-200 kg/ha can be achieved from properly managed crops." 2. rapidly reproduce both by seeds and vegetatively
6.03		no evidence
6.04	Lamp, C. and Collet, F. (1990). A Field Guide to Weeds in Australia. (Inkata Press, Melbourne)	"Generally cross pollinates with only 1-4% self compatibility. Cultivar Callide appears to be self pollinating."
6.05		no evidence--grasses are typically wind pollinated
6.06	1. Wagner, Warren L./Herbst, Derral R./Sohmer, S. H. 1999. Manual of the flowering plants of Hawaii. Revised edition. Bernice P. Bishop Museum special publication. University of Hawai'i Press/Bishop Museum Press, Honolulu. 2. CABI, https://www.cabi.org/isc/datasheet/13115#REF-DDB-184853 accessed (7/20/2020)	1. "vegetatively via its creeping stems (i.e. stolons)." 2. rapidly reproduce both by seeds and vegetatively

6.07	1. HEAR PIER Weed Risk Assessment for <i>Chloris gayana</i> http://www.hear.org/pier/wra/australia/chgay-wra.htm Accessed 4 September 2018 2. Welcome to NewCROPTM the New Crop Resource Online Program https://www.hort.purdue.edu/newcrop/duke_energy/Chloris_gayana.html accessed 7/20/2020	WRA states that there is 1 year generative time for <i>Chloris gayana</i> . Perennial or annual grass
7.01	Purdue University <i>Chloris gayana</i> factsheet https://www.hort.purdue.edu/newcrop/duke_energy/Chloris_gayana.html Accessed 4 September 2018	"A weed of roadsides, railways, disturbed sites, parks, gardens, footpaths."
7.02	Purdue University <i>Chloris gayana</i> factsheet https://www.hort.purdue.edu/newcrop/duke_energy/Chloris_gayana.html Accessed 4 September 2018	Seeds can be easily purchased, frequently sold. "Rhodesgrass is one of the best grasses for rotation grasslands in tropical and subtropical areas, useful for establishment of pasture leys. It is suitable for silage and hay, as well as for fodder. Liked by all kinds of stock"
7.03	Weeds of Australia Biosecurity Edition https://keyserver.lucidcentral.org/weeds/data/media/Html/chloris_gayana.htm 4 September 2018	"They may also be spread by slashers, graders, and in contaminated agricultural produce (e.g. pasture seed)."
7.04	Weeds of Australia Biosecurity Edition https://keyserver.lucidcentral.org/weeds/data/media/Html/chloris_gayana.htm 4 September 2018	"The seeds may be spread by wind and water."
7.05	Weeds of Australia Biosecurity Edition https://keyserver.lucidcentral.org/weeds/data/media/Html/chloris_gayana.htm 4 September 2019	"The seeds may be spread by wind and water."
7.06		no evidence
7.07	Bogdan, A.V. (1969) Review article : Rhodes grass . Herbage Abstracts, 39, 1-13.	"spreads on animal fur"
7.08		no evidence
8.01	1. Reed, C.F. 1976. Information summaries on 1000 economic plants. Typescripts submitted to the USDA. 2. Tropical Forages http://www.tropicalforages.info/key/forages/Media/Html/entities/chloris_gayana.htm 7/20/2020	1. "Seed yields range from 65 to 650 kg/ha" 2. 4 million seeds (spikelets)/kg for 'Katambora', and 7-10 million for most other varieties. Caryopsis brown, c. 2 mm long, 0.5 mm wide, separating readily from the spikelet in some varieties, about 2 million/kg.
8.02		no evidence of persistent propagule bank
8.03	1. NewCROPTM the New Crop Resource Online Program https://www.hort.purdue.edu/newcrop/duke_energy/Chloris_gayana.html accessed 7/20/2020 2. Herbiguide http://www.herbiguide.com.au/Descriptions/hg_Rhodes_Grass.htm accessed 7/20/2020.	"Susceptible to pre-emergence atrazine. Even when mature, it is readily controlled with the selective grass herbicide, haloxyfop. Weakened, but not killed by glyphosate at normal rates." 2. "Tolerates normal rates of glyphosate. Use 100 mL of glyphosate(450g/L) in 10 L water in early summer when the plants are actively growing or 6 L/ha on larger areas. 2 L/ha of metolachlor (720g/L) can be used as a pre-emergence treatment in spring to stop seedling establishment. Haloxyfop can be used in bushland or where damage to broad leaved species needs to be minimised. Repeat sprays may be required when regrowth is actively growing."
8.04	1. NewCROPTM the New Crop Resource Online Program https://www.hort.purdue.edu/newcrop/duke_energy/Chloris_gayana.html accessed 7/20/2020 2. Herbiguide http://www.herbiguide.com.au/Descriptions/hg_Rhodes_Grass.htm accessed 7/20/2020. 2. http://www.tropicalforages.info/key/forages/Media/Html/entities/chloris_gayana.htm Accessed 7/20/2020	Promoted as forage. 1. "New stands should be allowed to flower and set seed before being grazed or mown. Rotational grazing is desirable, as continuous heavy grazing permits rapid invasion of weeds, especially on sandy soils. Hay should be cut at early flowering stage, with 7–8 cuttings per year (Reed, 1976)." 2. <i>Chloris gayana</i> is tolerant of heavy grazing, but production is reduced by very frequent defoliation (e.g. 14 day v. 28 day).
8.05		no evidence