

<b><i>Urochloa humidicola (Brachiaria humidicola, Panicum humidicola) Creeping signal grass, Tully, koronivia grass</i></b>		<b>Answer</b>	<b>Score</b>
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 FL climates (USDA hardiness zones; 0 low, 1 intermediate, 2 high)	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 regions with an average of 11 60 inches of annual precipitation	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	n	0
3.04	Environmental weed	n	0
3.05	Congeneric weed	y	2
4.01	Produces spines, thorns or burrs	n	0
4.02	Allelopathic	y	1
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	y	1
4.07	Causes allergies or is otherwise toxic to humans		
4.08	Creates a fire hazard in natural ecosystems		
4.09	Is a shade tolerant plant at some stage of its life cycle	y	1
4.10	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils). North & Central Zones: infertile soils; South Zone: shallow limerock or Histisols.	y	1
4.11	Climbing or smothering growth habit	n	0
4.12	Forms dense thickets	n	0
5.01	Aquatic	n	0
5.02	Grass	y	1
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	n	-1
6.04	Self compatible or apomictic	?	
6.05	Requires specialist pollinators	n	0
6.06	Reproduction by vegetative propagation	y	1
6.07	Minimum generative time (years)		
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
7.02	Propagules dispersed intentionally by people	y	1
7.03	Propagules likely to disperse as a produce contaminant		
7.04	Propagules adapted to wind dispersal		
7.05	Propagules water dispersed		
7.06	Propagules bird dispersed		
7.07	Propagules dispersed by other animals (externally)		
7.08	Propagules dispersed by other animals (internally)		

8.01	Prolific seed production		
8.02	Evidence that a persistent propagule bank is formed (>1 yr)	n	-1
8.03	Well controlled by herbicides	y	-1
8.04	Tolerates, or benefits from, mutilation or cultivation	y	1
8.05	Effective natural enemies present in U.S.		
<b>Total Score</b>		<b>13</b>	
<b>Implemented Pacific Second Screening</b>		<b>No</b>	
<b>Risk Assessment Results</b>		<b>High Risk</b>	

section	# questions answered	satisfy minimum?
A	11	yes
B	10	yes
C	13	yes
total	34	yes

completed 1/23/2015

	Reference	Source data
1.01		Cultivated, but no evidence of selection for reduced weediness.
1.02		skip to 2.01
1.03		skip to 2.01
2.01	1. PERAL NAPPFAST Global Plant Hardiness ( <a href="http://www.nappfast.org/Plant_hardiness/NAPPFAST%20Global%20zones/10-year%20climate/PLANT_HARDINESS_10YR%20lgnd.tif">http://www.nappfast.org/Plant_hardiness/NAPPFAST%20Global%20zones/10-year%20climate/PLANT_HARDINESS_10YR%20lgnd.tif</a> ). 2. World Maps of Köppen-Geiger Climate Classification ( <a href="http://koeppen-geiger.vu-wien.ac.at/">http://koeppen-geiger.vu-wien.ac.at/</a> [accessed 1/22/2015]) & Global Biodiversity Information Facility ( <a href="http://www.gbif.org">www.gbif.org</a> [accessed 1/21/2015]) 2. USDA GRIN ( <a href="http://www.ars-grin.gov">http://www.ars-grin.gov</a> [accessed 1/21/2015])	No computer analysis performed. Native range well known. 1. Present in global hardiness zones 9-13. 2. Present in the following Köppen-Geiger Climate zones: Af, Aw, Bsh, Cfa, Cfb, Cwb. 2. Native to Africa: Northeast tropical (Ethiopia, Sudan), East Tropical (Kenya, Tanzania), West-Central (Zaire), South Tropical (Angola, Malawi, Mozambique, Zambia, Zimbabwe), Southern (Botswana, Namibia, South Africa).
2.02		No computer analysis was performed...Native range is well known; refer to 2.01 source data.
2.03	1. World Maps of Köppen-Geiger Climate Classification ( <a href="http://koeppen-geiger.vu-wien.ac.at/">http://koeppen-geiger.vu-wien.ac.at/</a> [accessed 1/22/2015]) & Global Biodiversity Information Facility ( <a href="http://www.gbif.org">www.gbif.org</a> [accessed 1/21/2015]) 2. Pastures of Australia ( <a href="http://keys.lucidcentral.org/keys/v3/pastures/Html/index.htm">http://keys.lucidcentral.org/keys/v3/pastures/Html/index.htm</a> [accessed 1/21/2015])	1. Present in the following Köppen-Geiger Climate zones: Af, Aw, Bsh, Cfa, Cfb, Cwb. 2. Native to Africa: Northeast tropical (Ethiopia, Sudan), East Tropical (Kenya, Tanzania), West-Central (Zaire), South Tropical (Angola, Malawi, Mozambique, Zambia, Zimbabwe), Southern (Botswana, Namibia, South Africa). 2. Adapted to tropical lowlands but will also grow to 1000m altitude in the tropics and in the lowland subtropics.
2.04	1. Africa Annual Precipitation Map ( <a href="http://www.randmcnally.com">www.randmcnally.com</a> [accessed 1/21/2015]), African plants database ( <a href="http://www.ville-ge.ch">www.ville-ge.ch</a> [accessed 1/21/2015]), and Flora of Central Africa ( <a href="http://floreafriquecentrale.org">floreafriquecentrale.org</a> [accessed 1/21/2015]) 2. Pastures of Australia ( <a href="http://keys.lucidcentral.org/keys/v3/pastures/Html/index.htm">http://keys.lucidcentral.org/keys/v3/pastures/Html/index.htm</a> [accessed 1/21/2015]) 3. Flora of Zimbabwe ( <a href="http://www.zimbabweflora.co.zw">www.zimbabweflora.co.zw</a> [accessed 1/21/2015]) 4. Tropical Forages ( <a href="http://www.tropicalforages.info">www.tropicalforages.info</a> [accessed 1/21/2015]).	1. Native range of this species in areas receiving between 20 and 80 inches of ppt. 2. suitable to areas receiving 1000mm ppt or more per year (1000mm=40 in). 3. Natural distribution of species lies in areas receiving 32-40 in ppt annually. 4. In native range, rainfall varies from 600-2800mm (23.6-110 in). In exotic environments, 1000-4000 mm (39.3-157.5 in) annual rainfall.
2.05	1. AusGrass2, Grasses of Australia ( <a href="http://www.ausgrass2.myspecies.info">www.ausgrass2.myspecies.info</a> [accessed 1/21/2015]) 2. Global Compendium of Weeds ( <a href="http://www.hear.org/gcw">www.hear.org/gcw</a> [accessed 1/21/2015]) 3. Brazilian Flora Checklist ( <a href="http://floradobrasil.jbrj.gov.br">floradobrasil.jbrj.gov.br</a> [accessed 1/21/2015]). 4. USDA GRIN ( <a href="http://www.ars-grin.gov">http://www.ars-grin.gov</a> [accessed 1/21/2015])	Still promoted as forage in Australia and Central and South America (various sources) 1. naturalized in western Australia, northern territory, Queensland. 2. listed as naturalised, weed (data from Australia) 3. Naturalized in Brasil in the Amazonian rainforest, Caatinga, Central Brazilian Savanna, Atlantic Rainforest, Pampa. 4. Listed as naturalized in Puerto Rico, French Guiana, Brazil, Columbia, and Ecuador.
3.01	1. AusGrass2, Grasses of Australia ( <a href="http://www.ausgrass2.myspecies.info">www.ausgrass2.myspecies.info</a> [accessed 1/21/2015]) 2. Global Compendium of Weeds ( <a href="http://www.hear.org/gcw">www.hear.org/gcw</a> [accessed 1/21/2015]) 3. Brazilian Flora Checklist ( <a href="http://floradobrasil.jbrj.gov.br">floradobrasil.jbrj.gov.br</a> [accessed 1/21/2015]). 4. USDA GRIN ( <a href="http://www.ars-grin.gov">http://www.ars-grin.gov</a> [accessed 1/21/2015])	1. naturalized in western Australia, northern territory, Queensland. 2. listed as naturalised, weed (data from Australia) 3. Naturalized in Brasil in the Amazonian rainforest, Caatinga, Central Brazilian Savanna, Atlantic Rainforest, Pampa. 4. Listed as naturalized in Puerto Rico, French Guiana, Brazil, Columbia, and Ecuador.
3.02	1. Global Compendium of Weeds ( <a href="http://www.hear.org/gcw">www.hear.org/gcw</a> [accessed 1/21/2015])	1. listed as naturalised, weed (data from Australia). No other information on severity of weediness
3.03		No evidence
3.04		No evidence
3.05	1. Pacific Island Ecosystems at Risk ( <a href="http://www.hear.org/pier">www.hear.org/pier</a> [accessed 1/21/2015]) 2. Holm et al. (1979) A Geographical Atlas of World Weeds.	1. Many Urochloa species listed as weeds including U. plantaginea listed as invasive in Hawaii; U subquadripara listed as invasive in American Samoa, the Fiji Islands, Guam, and other Pacific Islands. 2. Multiple Urochloa and Brachiaria species listed as significant and principal weeds.

4.01		No evidence, These features are not included in the species description.
4.02	1. Ribeiro et al. (2012) Allelopathic Activity of the Hydrolate and Water Decoction of <i>Brachiaria humidicola</i> (Rendle) Plant Parts on the Germination of Four Tropical Leguminous Species. International Scholarly Research Notes 2012: <a href="http://dx.doi.org/10.5402/2012/838767">http://dx.doi.org/10.5402/2012/838767</a> . 2. Subbarao et al. (2006) A bioluminescence assay to detect nitrification inhibitors released from plant roots: a case study with <i>Brachiaria humidicola</i> . Plant Soil 288:101–112	1. "In general, the hydrolate and decoction water of <i>B. humidicola</i> parts (shoot, root, and seed) showed inhibitory effect on receiving species, <i>L. sativa</i> , <i>Stylosanthes</i> spp., <i>M. axillare</i> , <i>C. mucunoides</i> , and <i>D. ovalifolium</i> ." 2. "Some tropical grassland species, including false creeping paspalum ( <i>Brachiaria humidicola</i> ), exude allelochemicals in the rhizosphere, with the potential to suppress soil nitrification"
4.03	1. USDA GRIN ( <a href="http://www.ars-grin.gov">http://www.ars-grin.gov</a> [accessed 1/21/2015])	1. Family: Poaceae (not a parasitic family).
4.04	1. Pastures of Australia ( <a href="http://keys.lucidcentral.org/keys/v3/pastures/Html/index.htm">http://keys.lucidcentral.org/keys/v3/pastures/Html/index.htm</a> [accessed 1/21/2015])	1. planted as forage for grazing and harvested as hay.
4.05	1. Pastures of Australia ( <a href="http://keys.lucidcentral.org/keys/v3/pastures/Html/index.htm">http://keys.lucidcentral.org/keys/v3/pastures/Html/index.htm</a> [accessed 1/21/2015])	1. No major problems reported in Australia, planted as forage for grazing and harvested as hay.
4.06	1. Cameron AG (2013) "Tully" Agnote No. E31 Northern Territory Govt, AU ( <a href="http://www.nt.gov.au/d">www.nt.gov.au/d</a> [accessed 1/21/2015]) 2. Lenné (1990) Rust on the tropical pasture grass <i>Brachiaria humidicola</i> in South America. Disease Note The American Phytopathological Society. DOI: 10.1094/PD-74-0720A. 3. Tropical Forages ( <a href="http://www.tropicalforages.info">www.tropicalforages.info</a> [accessed 1/21/2015]).	1. An introduced leaf rust, <i>Uromyces setariae-italicae</i> , originating from Africa, has attacked in Brazil, Columbia, Peru, and Ecuador, and can lead to 100% yield loss. 2. "A rust, caused by <i>Uromyces setariae-italicae</i> Yosh., is reported as a serious pathogen of the pasture grass <i>Brachiaria humidicola</i> (Rendle) Schweick. in humid regions of tropical South America. the rust has been previously recorded on 28 species of <i>Brachiaria</i> , including <i>B. brizantha</i> , <i>B. decumbens</i> , and <i>B. dictyoneura</i> , as well as species of the grasses <i>Eragrostis</i> , <i>Eriochloa</i> , <i>Melinis</i> , <i>Panicum</i> , <i>Paspalidium</i> , <i>Pennisetum</i> , <i>Setaria</i> , and <i>Urochloa</i> throughout eastern Africa and from several countries in Asia, the Caribbean, Central America, Australasia, and Oceania, as well as South America." 3. No pests or diseases observed to cause economic problems in Australia.
4.07		No evidence
4.08		No evidence
4.09	1. Tropical Forages ( <a href="http://www.tropicalforages.info">www.tropicalforages.info</a> [accessed 1/21/2015]). 2. Shelton et al. (1987) Pastures in the plantations of Asia and the Pacific: performance and prospect. Tropical Grasslands 21: 159-168. 3. Dias-Filho (2000) GROWTH AND BIOMASS ALLOCATION OF THE C4 GRASSES BRACHIARIA BRIZANTHA AND B. HUMIDICOLA UNDER SHADE. Pesq agropec bras, Brasília, 35:2335-2341	1. Moderate shade tolerance. 2. Shade tolerance listed as "medium" 3. "Both <i>B. brizantha</i> and <i>B. humidicola</i> quickly develop phenotypic adjustments as buffering mechanisms against light limitation and, as a consequence, are able to maintain growth to satisfactory levels under this condition."
4.10	1. Pastures of Australia ( <a href="http://keys.lucidcentral.org/keys/v3/pastures/Html/index.htm">http://keys.lucidcentral.org/keys/v3/pastures/Html/index.htm</a> [accessed 1/21/2015]) 2. Jungmann et al. (2010) Genetic diversity and population structure analysis of the tropical pasture grass <i>Brachiaria humidicola</i> based on microsatellites, cytogenetics, morphological traits, and geographical origin. Genome 53:698-709. 3. Tropical Forages ( <a href="http://www.tropicalforages.info">www.tropicalforages.info</a> [accessed 1/21/2015]).	1. Tolerant to a wide range of soil types; acid infertile sandy soils to heavy cracking clay soils. 2. " <i>Brachiaria humidicola</i> naturally occurs in areas of infertile and poorly drained soils or areas with seasonal flooding." 3. Grows on a wide range of soil types from acid infertile (pH 3.5) to high Al soils, heavy clay, high pH coralline sands. Tolerant of poor drainage.
4.11		No evidence
4.12		No evidence
5.01	1. USDA GRIN ( <a href="http://www.ars-grin.gov">http://www.ars-grin.gov</a> [accessed 1/21/2015])	1. Family: Poaceae
5.02	1. USDA GRIN ( <a href="http://www.ars-grin.gov">http://www.ars-grin.gov</a> [accessed 1/21/2015])	1. Family: Poaceae
5.03	1. USDA GRIN ( <a href="http://www.ars-grin.gov">http://www.ars-grin.gov</a> [accessed 1/21/2015])	1. Family: Poaceae
5.04	1. USDA GRIN ( <a href="http://www.ars-grin.gov">http://www.ars-grin.gov</a> [accessed 1/21/2015])	1. Family: Poaceae

6.01		No evidence
6.02	1. Tropical Forages ( <a href="http://www.tropicalforages.info">www.tropicalforages.info</a> [accessed 1/21/2015]).	1. Seeds can be hand harvested from the field with yields of 290 kg/ha in Columbia and 80-500 kg/ha in Brazil
6.03	1. Jungmann et al. (2010) Genetic diversity and population structure analysis of the tropical pasture grass <i>Brachiaria humidicola</i> based on microsatellites, cytogenetics, morphological traits, and geographical origin. <i>Genome</i> 53:698-709.	1. Reproduces primarily by apospory, a type of apomixis
6.04	1. Jungmann et al. (2010) Genetic diversity and population structure analysis of the tropical pasture grass <i>Brachiaria humidicola</i> based on microsatellites, cytogenetics, morphological traits, and geographical origin. <i>Genome</i> 53:698-709.	1. Reproduces primarily by apospory, a type of apomixis
6.05	1. Jungmann et al. (2010) Genetic diversity and population structure analysis of the tropical pasture grass <i>Brachiaria humidicola</i> based on microsatellites, cytogenetics, morphological traits, and geographical origin. <i>Genome</i> 53:698-709.	
6.06	1. Pastures of Australia ( <a href="http://keys.lucidcentral.org/keys/v3/pastures/Html/index.htm">http://keys.lucidcentral.org/keys/v3/pastures/Html/index.htm</a> [accessed 1/21/2015]) 2. Cameron AG (2013) "Tully" Agnote No. E31 Northern Territory Govt, AU ( <a href="http://www.nt.gov.au/d">www.nt.gov.au/d</a> [accessed 1/21/2015]) 3. Pacific Island Ecosystems at Risk ( <a href="http://www.hear.org/pier">www.hear.org/pier</a> [accessed 1/21/2015])	1. "Prostrate creeping stolons...roots vigorously at the nodes." 2. described as a strong creeping perennial that roots vigorously at the lower nodes forming a dense mat. 3. Creeping, giving rise to a number of stolons with culms arising at intervals, these usually geniculately ascending, often rooting at the nodes.
6.07		No evidence found (very little information about reproduction)
7.01		No evidence
7.02	1. Pastures of Australia ( <a href="http://keys.lucidcentral.org/keys/v3/pastures/Html/index.htm">http://keys.lucidcentral.org/keys/v3/pastures/Html/index.htm</a> [accessed 1/21/2015]) 2. Tropical Forages ( <a href="http://www.tropicalforages.info">www.tropicalforages.info</a> [accessed 1/21/2015]). 3. Shelton et al. (1987) Pastures in the plantations of Asia and the Pacific: performance and prospect. <i>Tropical Grasslands</i> 21: 159-168.	Planted in Australia and central and south America for forage
7.03		No evidence
7.04		No evidence
7.05		No evidence
7.06		No evidence
7.07		No evidence
7.08		No evidence
8.01		No evidence found (very little information about reproduction)
8.02	1. Pastures of Australia ( <a href="http://keys.lucidcentral.org/keys/v3/pastures/Html/index.htm">http://keys.lucidcentral.org/keys/v3/pastures/Html/index.htm</a> [accessed 1/21/2015])	1. seed can remain dormant for up to 9 mos.
8.03	1. Pastures of Australia ( <a href="http://keys.lucidcentral.org/keys/v3/pastures/Html/index.htm">http://keys.lucidcentral.org/keys/v3/pastures/Html/index.htm</a> [accessed 1/21/2015]) 2. Tropical Forages ( <a href="http://www.tropicalforages.info">www.tropicalforages.info</a> [accessed 1/21/2015]).	1. can be controlled using low rates of Diuron. Tolerant of selective herbicides used to control broadleaf weeds. 2. Spraying with glyphosate (3l/ha of 36% a.i.) will give sufficient control to establish a pasture legume.
8.04	1. Pastures of Australia ( <a href="http://keys.lucidcentral.org/keys/v3/pastures/Html/index.htm">http://keys.lucidcentral.org/keys/v3/pastures/Html/index.htm</a> [accessed 1/21/2015]) 2. Cameron AG (2013) "Tully" Agnote No. E31 Northern Territory Govt, AU ( <a href="http://www.nt.gov.au/d">www.nt.gov.au/d</a> [accessed 1/21/2015])	1. Heavy grazing for a short period of time during the wet season when plants are establishing promotes the production of runners. Once established it can tolerate heavy wet season grazing. Tolerant of fire. 2. Remains productive even under heavy grazing.
8.05		No evidence