Taxon: Bothriochloa bladhii (Retz.) S. T. Blake **Family:** Poaceae

Common Name(s): Australian bluestem
Burnett River bluegrass
Caucasian bluestem
forest bluegrass
plains bluestem
purple plume grass

Synonym(s): Andropogon bladhii Retz.
Andropogon intermediusR. Br.
Bothriochloa caucasica (Trin.) C.E.
Bothriochloa glabra (Roxb.) A. Camus
Bothriochloa intermedia (R. Br.) A.

Assessor: Chuck Chimera **Status:** Assessor Approved **End Date:** 20 Aug 2019

WRA Score: 19.0 **Designation:** H(HPWRA) **Rating:** High Risk

Keywords: Pasture Grass, Naturalized, Palatable, Apomictic, Wind-Dispersed

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
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
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
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
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
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
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

Qsn #	Question	Answer Option	Answer
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	y
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	y
303	Agricultural/forestry/horticultural weed		
303	Agricultural/forestry/horticultural weed		
304	Environmental weed		
304	Environmental weed		
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	y
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	y
401	Produces spines, thorns or burrs	y=1, n=0	n
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic	y=1, n=0	n
402	Allelopathic	y=1, n=0	n
403	Parasitic	y=1, n=0	n
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals	y=1, n=-1	n
404	Unpalatable to grazing animals	y=1, n=-1	n
405	Toxic to animals	y=1, n=0	n
405	Toxic to animals	y=1, n=0	n
406	Host for recognized pests and pathogens		
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
408	Creates a fire hazard in natural ecosystems	y=1, n=0	y
408	Creates a fire hazard in natural ecosystems	y=1, n=0	y
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	y
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	y
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	n
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	n
501	Aquatic	y=5, n=0	n
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	y

Qsn #	Question	Answer Option	Answer
502	Grass	y=1, n=0	y
503	Nitrogen fixing woody plant	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
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
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally	y=1, n=-1	y
603	Hybridizes naturally	y=1, n=-1	y
604	Self-compatible or apomictic	y=1, n=-1	y
604	Self-compatible or apomictic	y=1, n=-1	y
605	Requires specialist pollinators	y=-1, n=0	n
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	1
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	1
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	y
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	y
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant		
703	Propagules likely to disperse as a produce contaminant		
704	Propagules adapted to wind dispersal	y=1, n=-1	y
704	Propagules adapted to wind dispersal	y=1, n=-1	y
705	Propagules water dispersed		
705	Propagules water dispersed		
706	Propagules bird dispersed	y=1, n=-1	n
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)		
707	Propagules dispersed by other animals (externally)		

Qsn #	Question	Answer Option	Answer
708	Propagules survive passage through the gut		
708	Propagules survive passage through the gut		
801	Prolific seed production (>1000/m2)		
801	Prolific seed production (>1000/m2)		
802	Evidence that a persistent propagule bank is formed (>1 yr)		
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides	y=-1, n=1	y
803	Well controlled by herbicides	y=-1, n=1	y
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	y
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	y
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	n
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	n

Supporting Data:

Qsn #	Question	Answer
101	**Is the species highly domesticated?**	**n**
	Source(s)	**Notes**
	Pengelly, B. C., Hall, E., Auricht, G., Bennell, M., & Cook, B. G. (2006). Identifying potential pasture species for grazing systems in the Mallee-Wimmera. CSIRO Sustainable Ecosystems, Canberra	[Cultivation has not resulted in domestication, nor reduced invasive characteristics] "Cultivars have been successful mostly in areas with rainfall above 750 mm, although can tolerate as low as 600 mm/yr. Can stand temporary waterlogging and flooding, but not tolerant of permanently wet conditions."

102	**Has the species become naturalized where grown?**	
	Source(s)	**Notes**
	WRA Specialist. (2019). Personal Communication	NA

103	**Does the species have weedy races?**	
	Source(s)	**Notes**
	WRA Specialist. (2019). 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**

Qsn #	Question	Answer
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 18 Aug 2019]	"Native Africa NORTHEAST TROPICAL AFRICA: Ethiopia EAST TROPICAL AFRICA: Kenya, Tanzania (incl. Pemba, Zanzibar), Uganda WEST-CENTRAL TROPICAL AFRICA: Cameroon, Democratic Republic of the Congo WEST TROPICAL AFRICA: Burkina Faso, Ghana, Nigeria, Senegal SOUTH TROPICAL AFRICA: Angola, Malawi, Mozambique, Zambia, Zimbabwe SOUTHERN AFRICA: Botswana, Eswatini, Namibia, South Africa [KwaZulu-Natal, Eastern Cape, Northern Cape, Gauteng, Limpopo, Mpumalanga, North-West] Asia-Temperate WESTERN ASIA: Afghanistan, Iran CAUCASUS: Armenia, Azerbaijan, Russian Federation-Ciscaucasia [Ciscaucasia] MIDDLE ASIA: Kazakhstan (s.), Kyrgyzstan CHINA: China [Anhui Sheng, Fujian Sheng, Hunan Sheng, Hubei Sheng, Guangdong Sheng, Guizhou Sheng, Shaanxi Sheng, Sichuan Sheng, Yunnan Sheng, Guangxi Zhuangzu Zizhiqu, Xinjiang Uygur Zizhiqu] EASTERN ASIA: Japan, [Ryukyu Islands] Taiwan Asia-Tropical INDIAN SUBCONTINENT: Bhutan, India, Nepal, Pakistan, Sri Lanka PAPUASIA: Papua New Guinea INDO-CHINA: Cambodia, Laos, Myanmar, Thailand, Vietnam MALESIA: Indonesia, Malaysia Australasia AUSTRALIA: Australia [New South Wales, Queensland, South Australia, Western Australia (tropical), Northern Territory]"
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"Tropical Africa, China, Japan, India, Indonesia, Nepal, Malaysia, Australia."

202	Quality of climate match data	High
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 18 Aug 2019]	

203	Broad climate suitability (environmental versatility)	y
	Source(s)	**Notes**
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 18 Aug 2019]	"Occurs from sea level near the equator to >2,500 m at 32º latitude, representing a difference of some 14ºC in average annual temperature over the distributional range."

Qsn #	Question	Answer
204	**Native or naturalized in regions with tropical or subtropical climates**	**y**
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Lorence, D.H. (2019). Flora of the Hawaiian Islands. Smithsonian Institution, Washington, D.C. http://botany.si.edu/. [Accessed 19 Aug 2019]	"Bothriochloa bladhii (Retz.) S.T. Blake Status: Naturalized Distribution: O/ Mo/ EM/ Ka (Moaulanui)/ H"
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"Tropical Africa, China, Japan, India, Indonesia, Nepal, Malaysia, Australia."

205	**Does the species have a history of repeated introductions outside its natural range?**	**y**
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 19 Aug 2019]	"Naturalized Australasia NEW ZEALAND: New Zealand Northern America SOUTH-CENTRAL U.S.A.: United States [Texas] Southern America CARIBBEAN: Barbados, Cuba, Dominican Republic, United States [Virgin Islands, U.S.] SOUTHERN SOUTH AMERICA: Argentina [La Pampa]"

301	**Naturalized beyond native range**	**y**
	Source(s)	**Notes**
	Starr, F., Starr, K. & Loope, L.L. 2006. New plant records from the Hawaiian Archipelago. Bishop Museum Occasional Papers 87: 31-43	"Bothriochloa bladhii (airport grass) was previously known from Moloka‘i, Maui, and Hawai‘i (Herbarium Pacificum Staff, 1997; Wagner et al., 1999). This collection represents a new island record for Kaho‘olawe where this grass is established, though not common, on the summit. Material examined. KAHO‘OLAWE: Moaulanui, north rim, in hardpan on side of road, windswept shrub/grassland, 1450 ft [441 m], 30 Jul 2003, Starr, Starr, Abbott, & Mar 030730-1."
	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.	"Bothriochloa bladhii (Retz.) S. T. Blake [B. intermedia (R. Br.) Camus] has been collected a few times on Moloka'i and Hawai'i in pastures; the first collection was made on Moloka'i in 1916 (Hitchcock 15079, BISH)."
	Herbarium Pacificum Staff. (1997). New Hawaiian Plant Records for 1996. Bishop Museum Occasional Papers 49: 18-19	"Bothriochloa bladhii (Retz.) S. T. Blake New island record This species was mentioned in passing in the Wagner et al. (1990: 1502) as a taxon needing further study; its known distribution at that time was from Moloka‘i and the island of Hawaii. This collection is the first record from Maui. Material examined. MAUI: East Maui, south side of Kahului Airport, on roadside, 1 Dec 1995, R. Hobdy 3911."
	Herbarium Pacificum Staff. 1996. New Hawaiian pest plant records for 1995. Bishop Museum Occasional Papers. 46: 3 -8	"Bothriochloa bladhii (Retz.) S. T. Blake New island record This species was mentioned in passing in the Wagner et al. (1990: 1502) as a taxon needing further study; its known distribution at that time was from Moloka‘i and the island of Hawaii. This collection is the first record from Maui. Material examined. MAUI: East Maui, south side of Kahului Airport, on roadside, 1 Dec 1995, R. Hobdy 3911."

Qsn #	Question	Answer
	Snow, N. (2008). Notes on grasses (Poaceae) in Hawai'i. Bishop Museum Occasional Papers 100: 38-43	"Bothriochloa bladhii (Retz.) S.T. Blake New island record This is a widespread species in Australia and the Pacific. Prior to this record for O'ahu, B. bladhii was known from Kaua'i, Moloka'i, Maui, and Hawai'i. Material examined: O'AHU: Ka'ala Natural Area Reserve, ridge between Kaimuhola and Alaiheihe, gulches between access road, 396 m (1300 ft), 11 Feb 2008, US Army 79."
	Frohlich, D. & Lau, A. 2010. New plant records from O'ahu for 2008. Bishop Museum Occasional Papers 107: 3-18	"Bothriochloa bladhii (Retz.) S.T.Blake New island record Australian bluestem was previously known from Moloka'i, Hawai'i (Wagner et al. 1999) Kaua'i (Herbarium Pacificum Staff 1997) and Maui (Starr et al. 2003). A forage grass and colonizer of rangeland pastures, waste areas, and other disturbed sites (Barkworth et al. 2003), this species was first collected on O'ahu at the Hawaii Agricultural Experiment Station in 1940. Material examined. O'AHU: Ridge between Kaimuhole and Alaiheihe, on ridge crest 1300 ft [396 m], K. Kawelo USARMY 79."
	Smith, A.C. (1979). Flora Vitiensis Nova - A New Flora of Fiji (Spermatophytes Only). Volume 1. Pacific Tropical Botanical Garden, Lawai, HI	"In Fiji, naturalized in dry zones on open hillsides, in pastures and canefields, and along roadsides from sea level to about 60 m"
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 19 Aug 2019]	"Naturalized Australasia NEW ZEALAND: New Zealand Northern America SOUTH-CENTRAL U.S.A.: United States [Texas] Southern America CARIBBEAN: Barbados, Cuba, Dominican Republic, United States [Virgin Islands, U.S.] SOUTHERN SOUTH AMERICA: Argentina [La Pampa]"
	Hanelt, P. (ed.). (2001). Mansfeld's Encyclopedia of Agricultural and Horticultural Crops: (Except Ornamentals). Angiospermae - Monocotyledones: Orchidaceae - Pandanaceae, Volume 5. Springer-Verlag, Berlin, Heidelberg, New York	"SW Asia and India to China, elsewhere naturalized"

302	Garden/amenity/disturbance weed	y
	Source(s)	**Notes**
	Grace, J.B., M.D. Smith, S.L. Grace, S.L. Collins, and T.J. Stohlgren. (2001). Interactions between fire and invasive plants in temperate grasslands of North America. Pp. 40–65 in K.E.M. Galley and T.P. Wilson (eds.). Proceedings of the Invasive Species Workshop: the Role of Fire in the Control and Spread of Invasive Species. Fire Conference 2000: the First National Congress on Fire Ecology, Prevention, and Management. Miscellaneous Publication No. 11, Tall Timbers Research Station, Tallahassee, FL	"Table 1. List of nonnative, invasive plants of major concern in the central grasslands of the United States" [Includes Bothriochloa bladhii]
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 19 Aug 2019]	"Weed potential - Shows indications of becoming a weed of turf."
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"weed species, sometimes invasive"

Qsn #	Question	Answer
	Czarapata, E. J. 2005. Invasive Plants of the Upper Midwest: An Illustrated Guide to Their Identification and Control. University of Wisconsin Press, Madison, Wisconsin	Listed as a weed of upper midwest [potential impacts unknown]
	WRA Specialist. (2019). Personal Communication	Regarded as a weedy species, with possible negative impacts on agriculture (see Question 3.03) and environment (see Question 3.04) but direct evidence is lacking

303	Agricultural/forestry/horticultural weed	
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Weed of: Pastures"
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 19 Aug 2019]	"Weed potential - Shows indications of becoming a weed of turf."
	Moody, K. 1989. Weeds Reported in Rice in South and Southeast Asia. International Rice Research Institute, Manila, Philippines	Recorded as a weed of rice crops. Impacts unspecified

304	Environmental weed	
	Source(s)	**Notes**

Qsn #	Question	Answer
	Schmidt, C. D., Hickman, K. R., Channell, R., Harmoney, K., & Stark, W. (2008). Competitive abilities of native grasses and non-native (Bothriochloa spp.) grasses. Plant Ecology, 197(1), 69-80	"Abstract Old World Bluestems (OWB), introduced from Europe and Asia in the 1920s, recently have begun to raise concerns in the Great Plains. Despite suggestion in the late 1950s that OWB were weedy and negatively impacted biological diversity, they were widely introduced throughout the Great Plains for agricultural purposes. Anecdotal evidence suggests that OWB exhibit invasive characteristics that promote competitive exclusion of native species. The objective of our study was to quantify the competitive abilities of two OWB species (Caucasian bluestem; Bothriochloa bladhii (Retz.) S.T. Blake (= Bothriochloa caucasica (Trin.) C.E. Hubb.) and yellow bluestem; Bothriochloa ischaemum (L.) Keng) with three native grass species (big bluestem (Andropogon gerardii Vitman), little bluestem (Schizachyrium scoparium (Michx.) Nash), and sideoats grama (Bouteloua curtipendula (Michx.) Torr.)). A greenhouse target neighbor study was conducted to assess both interspecific and intraspecific competition. A total of 480 pots (4.4 l) filled with native soil was used with all pair-wise combinations of species and four density treatments (six replications). Vegetative tiller height, above- and belowground biomass were measured at the end of 16 weeks. Both of the OWB significantly inhibited at least one growth parameter of the three native grass species, while most of the native species did not inhibit growth of either OWB species. Growth of B. ischaemum was enhanced when grown in association with S. scoparium. Based upon the results of our study of OWB competitive superiority and previous research, many of the characteristics possessed by OWB are found to be in common with known invasive species. Hence, we propose that two OWB are competitively superior to three common native prairie species providing them with the ability to invade and threaten the native grasslands of the Central and Southern Great Plains."
	Wilson, G. W.T. & Hickman, K. R. (2008). Alteration of soil function and biota by an invasive, non-native C4 grass. 93rd ESA Annual Meeting. August 3 - August 8. Milwaukee, Wisconsin	"Background/Question/Methods Old World bluestems (OWB, Bothriochloa bladhii; B. ischaemum) are perennial, warm-season grasses native to Europe and Asia introduced to the U.S. in the 1920s and planted throughout the Great Plains. It has been estimated that >1 million ha have been planted to OWB in Texas and Oklahoma, alone. Until recently, studies on OWB have focused primarily on forage potential, rather than invasibility. Recent evidence suggests these species are highly invasive and reduce native biodiversity. To assess the competitive ability of this invasive grass, a greenhouse study was conducted in which native grasses (Andropogon gerardii; Schizachyrium scoparium) were grown in monoculture or in combination with OWB"
	WRA Specialist. (2019). Personal Communication	Potential environmental weed, but primarily established and may impact disturbed habitats and agricultural settings

305	Congeneric weed	y
	Source(s)	**Notes**

Qsn #	Question	Answer
	Hickman, K. R., Farley, G. H., Channell, R., & Steier, J. E. (2006). Effects of old world bluestem (Bothriochloa ischaemum) on food availability and avian community composition within the mixed-grass prairie. The Southwestern Naturalist, 51(4), 524-530	"In a mixed-grass prairie habitat in south central Kansas, bird species richness, bird abundance and food availability (arthropod biomass) were significantly lower in OWB monocultures than in native rangeland. Importantly, OWB monocultures had lower heterogeneity of vegetation structure, as well as fewer forbs than the native rangeland sites, potentially contributing to the reduced species richness and abundance of the grassland birds."
	Sammon, J. G., & Wilkins, K. T. (2005). Effects of an invasive grass (Bothriochloa ischaemum) on a grassland rodent community. Texas Journal of Science, 57(4), 371-382	"Rodent communities in central Texas were found to have reduced species richness and abundance in OWB monocultures compared to habitats dominated by native grasses" [B. ischaemum]
	CABI. (2019). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	[Bothriochloa ischaemum & Bothriochloa pertusa] "Bothriochloa ischaemum (yellow bluestem) … B. ischaemum is a warm seasoned perennial grass in the Poaceae family which is native to Europe, Asia and Africa. There are two varities of B. ischaemum, var. ischaemum and B. ischaemum var. songarica, which have different native ranges and have been introduced into different countries. This species was introduced into the North American Great Plains in the 1920s to tackle soil erosion and for forage production. This species has since been planted onto millions of hectares of marginal rangeland, roadsides and Conservation Reserve Program lands (Harmoney et al., 2004). B. ischaemum can readily escape original planting sites where it can invade native rangelands, with negative ecological and economic consequences such as the formation of monocultures and the loss of native biodiversity. This species is a particular problem in Texas where dense monocultures are displacing native grass species." … "Bothriochloa pertusa (pitted beard grass) … B. pertusa is a perennial grass native to eastern and southern Asia. It has been widely introduced outside Asia, in the Americas, Australia and the Pacific, either accidentally or probably in some cases deliberately for use as a forage grass. It has established itself in many habitats where it is able to out-compete native species due to its ability to establish dense mats and shade out slower establishing species. In Australia it is now an established invasive species in both the Northern Territory and central Queensland. It is similarly regarded as invasive in Mexico, in Cuba, Puerto Rico, the Dominican Republic, Anguilla and the Cayman Islands in the Caribbean, in Mauritius, and in New Caledonia, the Marquesas Islands, Midway Atoll and Hawaii in the Pacific. In Hawaii, it is among species threatening the endangered plants Spermolepis hawaiiensis and Wilkesia hobdyi. Through its effects on native vegetation, it likewise threatens the endangered lizard Ameiva polops in the US Virgin Islands, and affects populations of ants and birds in Australia."

401	Produces spines, thorns or burrs	n
	Source(s)	**Notes**

Qsn #	Question	Answer
	Wu, Z.Y., Raven, P.H. & Hong, D.Y. (eds.). 2006. Flora of China. Vol. 22 (Poaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	[No evidence] "Perennial, tufted. Culms erect or decumbent at base, fairly robust, up to 130 cm tall, many noded, nodes glabrous or appressed bearded. Leaf sheaths glabrous; leaf blades linear, 10–40 × 0.2–1 cm, hairy with tubercle-based hairs on both surfaces or abaxial surface glabrous, apex finely acuminate; ligule 0.5–1.5 mm. Inflorescence 9–20 cm, composed of many racemes borne in loose whorls along an elongate central axis, axis usually longer than lowest raceme, sometimes paniculate with branchedpeduncles; racemes 2–5 cm, often purplish, not obviously hairy; rachis internodes and pedicels thinly ciliate, shortly bearded at apex. Sessile spikelet 3–4 mm; lower glume narrowly oblong-lanceolate, herbaceous or cartilaginous and glossy, –7-veined, back slightly concave, glabrous or pubescent below middle, sometimes with a pit, margins keeled and scabrid near apex; awn of upper lemma 1–2.5 cm. Pedicelled spikelet barren or rarely staminate, narrower than sessile spikelet, sometimes pitted."

402	Allelopathic	n
	Source(s)	**Notes**
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 19 Aug 2019]	"Grows well with legumes and other grasses. May become dominant when sown with more palatable grasses such as Digitaria eriantha."

403	Parasitic	n
	Source(s)	**Notes**
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"Perennial or annual, very variable decreaser species, very vigorous, shortly rhizomatous, tufted or loosely tufted, bluish green, aromatic, tall, erect and stout, often robust" [Poaceae. No evidence]

404	Unpalatable to grazing animals	n
	Source(s)	**Notes**
	Hanelt, P. (ed.). (2001). Mansfeld's Encyclopedia of Agricultural and Horticultural Crops: (Except Ornamentals). Angiospermae - Monocotyledones: Orchidaceae - Pandanaceae, Volume 5. Springer-Verlag, Berlin, Heidelberg, New York	"In semi-arid tropical and subtropical regions cultivated as a valuable grass for pasture and hay. In the south-western USA used for reseeding dry rangeland."
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"native pasture species, cultivated, suitable for hay and silage, grazed while still young, low grazing value, palatable or not, excellent fodder, forage,"

405	Toxic to animals	n
	Source(s)	**Notes**
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 19 Aug 2019]	"No record of toxicity."

Qsn #	Question	Answer
	Hanelt, P. (ed.). (2001). Mansfeld's Encyclopedia of Agricultural and Horticultural Crops: (Except Ornamentals). Angiospermae - Monocotyledones: Orchidaceae - Pandanaceae, Volume 5. Springer-Verlag, Berlin, Heidelberg, New York	[No evidence] "In semi-arid tropical and subtropical regions cultivated as a valuable grass for pasture and hay. In the south-western USA used for reseeding dry rangeland."

406	Host for recognized pests and pathogens	
	Source(s)	**Notes**
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 19 Aug 2019]	"In Australia, the same pests and diseases attack introduced varieties, as are found on the native ecotypes of Bothriochloa bladhii. Seed crops can be adversely affected by a leafhopper, Balclutha rubrostriata (Cicadellidae) that infests the inflorescence . Leaf rust caused by Puccinia duthiae is often severe late in the growing season, and is favoured by wet weather. The combination of rust affected leaf and the high stem component at flowering renders the forage unpalatable to livestock late in the growing season in lightly summer-grazed stands."
	Pengelly, B. C., Hall, E., Auricht, G., Bennell, M., & Cook, B. G. (2006). Identifying potential pasture species for grazing systems in the Mallee-Wimmera. CSIRO Sustainable Ecosystems, Canberra	[No indication that these diseases are found exclusively on B. bladhii] "In Australia, the same pests and diseases attack introduced varieties, as are found on the native ecotypes of Bothriochloa bladhii. Seed crops can be adversely affected by a leafhopper, Balclutha rubrostriata (Cicadellidae) that infests the inflorescence . Leaf rust caused by Puccinia duthiae is often severe late in the growing season, and is favoured by wet weather. The combination of rust affected leaf and the high stem component at flowering renders the forage unpalatable to livestock late in the growing season in lightly summer-grazed stands."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	**Notes**
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 19 Aug 2019]	"No record of toxicity."

408	Creates a fire hazard in natural ecosystems	y
	Source(s)	**Notes**
	Humphreys, L. R. (1991). Tropical Pasture Utilisation. Cambridge University Press. Cambridge, UK	"Ash et al. (1982) burnt a native pasture dominated by Heteropogon contortus and Bothriochloa bladhii in mid-October. The proportion of green leaf increased to a maximum of 68% in the burnt pasture in January" [Tolerates burning]
	Pengelly, B. C., Hall, E., Auricht, G., Bennell, M., & Cook, B. G. (2006). Identifying potential pasture species for grazing systems in the Mallee-Wimmera. CSIRO Sustainable Ecosystems, Canberra	"Very tolerant of fire." [Likely to increase fire hazard if tolerant to fire]

409	Is a shade tolerant plant at some stage of its life cycle	y

Qsn #	Question	Answer
	Source(s)	**Notes**
	Pengelly, B. C., Hall, E., Auricht, G., Bennell, M., & Cook, B. G. (2006). Identifying potential pasture species for grazing systems in the Mallee-Wimmera. CSIRO Sustainable Ecosystems, Canberra	"Low to moderate shade tolerance."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	**Notes**
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 19 Aug 2019]	"Grows on soils with textures from sandy loam to clays and hard-setting clay loams, with pH from 5.5-8.4. Grows on both fertile and infertile soils, provided exchangeable aluminium levels are fairly low."
	Barnes, R. F., Nelson, C. J., Collins, M. & Moore, K. J. (2003). Forages: An Introduction to Grassland Agriculture. Blackwell Publishing. Ames, Iowa	"It is adaptable to medium-textured soils and tolerates low fertility and acid soils. However, it does not tolerate poor drainage or drought."

411	Climbing or smothering growth habit	n
	Source(s)	**Notes**
	Wu, Z.Y., Raven, P.H. & Hong, D.Y. (eds.). 2006. Flora of China. Vol. 22 (Poaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"Perennial, tufted. Culms erect or decumbent at base, fairly robust, up to 130 cm tall"

412	Forms dense thickets	n
	Source(s)	**Notes**
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"weed species, sometimes invasive" [Despite weediness, no mention of monoculture or dense thicket formation]

501	Aquatic	n
	Source(s)	**Notes**
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[Terrestrial] "naturalized in dry zones on open hillsides, common along roadsides, swamp margins, streamsides, damp places, rough grassland, on riverbanks, moist sites, low lying areas, woodlands, borders of woods, margins of fields, vleis, disturbed habitats"

502	Grass	y
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 19 Aug 2019]	Family: Poaceae (alt.Gramineae) Subfamily: Panicoideae Tribe: Andropogoneae Subtribe: Anthristiriinae

503	Nitrogen fixing woody plant	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 19 Aug 2019]	Family: Poaceae (alt.Gramineae) Subfamily: Panicoideae Tribe: Andropogoneae Subtribe: Anthristiriinae

504	**Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)**	**n**
	Source(s)	**Notes**
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"Perennial or annual, very variable decreaser species, very vigorous, shortly rhizomatous"

601	**Evidence of substantial reproductive failure in native habitat**	**n**
	Source(s)	**Notes**
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[No evidence. Widespread] "Tropical Africa, China, Japan, India, Indonesia, Nepal, Malaysia, Australia."

602	**Produces viable seed**	**y**
	Source(s)	**Notes**
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 20 Aug 2019]	"Fresh seed has low germination and takes 6-7 months after harvest to reach maximum germination. Establishes well from seed broadcast onto a cultivated surface, sown at 1-3 kg/ha. This is a fluffy seed, so there may be benefit in pelleting de-awned seed to make it easier to pass through planting equipment."
	Skerman, P.J. & Riveros, F. 1990. Tropical Grasses. FAO, Rome	"It will spread slowly by seed.

603	**Hybridizes naturally**	**y**
	Source(s)	**Notes**
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"hybridize freely with other species and genera,"
	Skerman, P.J. & Riveros, F. 1990. Tropical Grasses. FAO, Rome	"No cultivars are registered but hybrids exist."

604	**Self-compatible or apomictic**	**y**
	Source(s)	**Notes**
	Schmidt, C. D., & Hickman, K. R. (2006). Stolon production by Caucasian bluestem (Bothriochloa bladhii). Transactions of the Kansas Academy of Science, 109(1), 74-77	"C4 perennial bunchgrass, reproduces by rhizomes, stolons, and seeds via apomixis"

Qsn #	Question	Answer
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 20 Aug 2019]	"Facultative apomict."

605	Requires specialist pollinators	n
	Source(s)	**Notes**
	Kellogg, E. A. 2015. The Families and Genera of Vascular Plants. Volume XIII. Flowering Plants. Monocots: Poaceae. Springer International Publishing, Switzerland	"Most grasses are wind-pollinated."

606	Reproduction by vegetative fragmentation	y
	Source(s)	**Notes**
	Schmidt, C. D., & Hickman, K. R. (2006). Stolon production by Caucasian bluestem (Bothriochloa bladhii). Transactions of the Kansas Academy of Science, 109(1), 74-77	"C4 perennial bunchgrass, reproduces by rhizomes, stolons, and seeds via apomixis"
	Scattini, W. (2008). Forest bluegrass. Pastures Australia. https://keys.lucidcentral.org/keys/v3/pastures/Html/Forest_bluegrass.htm. [Accessed 20 Aug 2019]	"It spreads by seed and expands by short rhizomes."

607	Minimum generative time (years)	1
	Source(s)	**Notes**
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"Perennial or annual"

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y
	Source(s)	**Notes**
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"common along roadsides" [Probably yes considering frequency along roadsides]
	Australian Biological Resources Study. 2002. Flora of Australia, Volume 43. Poaceae 1. Introduction and Atlas. CSIRO Publishing, Collingwood, Australia	"Valuable summer-growing drought-resistant chiefly perennial and native forage grasses; sometimes roadside weeds" [Probably yes considering frequency along roadsides]

702	Propagules dispersed intentionally by people	y
	Source(s)	**Notes**
	Barnes, R. F., Nelson, C. J., Collins, M. & Moore, K. J. (2003). Forages: An Introduction to Grassland Agriculture. Blackwell Publishing. Ames, Iowa	"grown for pasture and hay"

703	Propagules likely to disperse as a produce contaminant	

Qsn #	Question	Answer
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Major Pathway/s: Contaminant, Herbal, Ornamental, Pasture"
	Moody, K. 1989. Weeds Reported in Rice in South and Southeast Asia. International Rice Research Institute, Manila, Philippines	[Possibly a contaminant of rice crops] "recorded as a weed of rice crops"

704	Propagules adapted to wind dispersal	y
	Source(s)	**Notes**
	Page, M. J., Newlands, L., & Eales, J. (2002). Effectiveness of three seed-trap designs. Australian Journal of Botany, 50(5), 587-594	[Bothriochloa bladhii - Dispersal: W = wind dispersal] "Table 3. Species recorded in each trial, their growth form and dispersal mechanism G = grass, F = forb, S = shrub, A = adhesive dispersal, W = wind dispersal, U = unassisted, B = bird dispersal"

705	Propagules water dispersed	
	Source(s)	**Notes**
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 20 Aug 2019]	"can stand temporary waterlogging and flooding, but not tolerant of permanently wet conditions."
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[Occurrence near aquatic and riparian habitats suggests likely dispersal by water] "common along roadsides, swamp margins, streamsides, damp places, rough grassland, on riverbanks, moist sites, low lying areas, woodlands, borders of woods, margins of fields, vleis, disturbed habitats"

706	Propagules bird dispersed	n
	Source(s)	**Notes**
	Page, M. J., Newlands, L., & Eales, J. (2002). Effectiveness of three seed-trap designs. Australian Journal of Botany, 50(5), 587-594	[Bothriochloa bladhii - Dispersal: W = wind dispersal] "Table 3. Species recorded in each trial, their growth form and dispersal mechanism G = grass, F = forb, S = shrub, A = adhesive dispersal, W = wind dispersal, U = unassisted, B = bird dispersal"

707	Propagules dispersed by other animals (externally)	
	Source(s)	**Notes**
	Page, M. J., Newlands, L., & Eales, J. (2002). Effectiveness of three seed-trap designs. Australian Journal of Botany, 50(5), 587-594	[Bothriochloa bladhii - Dispersal: W = wind dispersal] "Table 3. Species recorded in each trial, their growth form and dispersal mechanism G = grass, F = forb, S = shrub, A = adhesive dispersal, W = wind dispersal, U = unassisted, B = bird dispersal"
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed]	[Could possibly adhere to animals grazing in pastures, but otherwise lacks means of external attachment] "Spreads by seed, colonising away from the parent stand under favourable conditions. Can spread into sward grasses such as Axonopus fissifolius and Digitaria didactyla ."

Qsn #	Question	Answer
708	**Propagules survive passage through the gut**	
	Source(s)	**Notes**
	Skerman, P.J. & Riveros, F. 1990. Tropical Grasses. FAO, Rome	"A very useful native grass for beef cattle in central and southern coastal Queensland, Australia." [Unknown if viable seeds can pass through gut]
	Hanelt, P. (ed.). (2001). Mansfeld's Encyclopedia of Agricultural and Horticultural Crops: (Except Ornamentals). Angiospermae - Monocotyledones: Orchidaceae - Pandanaceae, Volume 5. Springer-Verlag, Berlin, Heidelberg, New York	"In semi-arid tropical and subtropical regions cultivated as a valuable grass for pasture and hay. In the south-western USA used for reseeding dry rangeland." [Unknown if viable seeds can pass through gut]

801	**Prolific seed production (>1000/m2)**	
	Source(s)	**Notes**
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 20 Aug 2019]	"1.6 million seed units/kg." [Prolific seed production in cultivation. Seed densities in naturalized settings unspecified]
	Scattini, W. (2008). Forest bluegrass. Pastures Australia. https://keys.lucidcentral.org/keys/v3/pastures/Html/Forest_bluegrass.htm. [Accessed 20 Aug 2019]	"100-150 kg/ha seed may be obtained from nitrogen fertilised stands or on more fertile soils in first year." [Seed production in natural settings unknown]

802	**Evidence that a persistent propagule bank is formed (>1 yr)**	
	Source(s)	**Notes**
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 20 Aug 2019]	"Fresh seed has low germination and takes 6-7 months after harvest to reach maximum germination. Establishes well from seed broadcast onto a cultivated surface, sown at 1-3 kg/ha. This is a fluffy seed, so there may be benefit in pelleting de-awned seed to make it easier to pass through planting equipment."
	Royal Botanic Gardens Kew. (2019) Seed Information Database (SID). Version 7.1. Available from: http://data.kew.org/sid/. [Accessed 20 Aug 2019]	"Storage Behaviour: Orthodox Storage Conditions: 70 % viability following drying to mc's in equilibrium with 15 % RH and freezing for 13 years at -20ºC at RBG Kew, WP." [Unknown under natural conditions]

803	**Well controlled by herbicides**	**y**
	Source(s)	**Notes**
	Scattini, W. (2008). Forest bluegrass. Pastures Australia. https://keys.lucidcentral.org/keys/v3/pastures/Html/Forest_bluegrass.htm. [Accessed 20 Aug 2019]	"It is killed by glyphosate and is tolerant of atrazine at low rate."
	Pengelly, B. C., Hall, E., Auricht, G., Bennell, M., & Cook, B. G. (2006). Identifying potential pasture species for grazing systems in the Mallee-Wimmera. CSIRO Sustainable Ecosystems, Canberra	"Tolerant of pre- and post-emergent (2-3-leaf stage) applications of metsulfuron methyl and triasulfuron. Susceptible to imazapic in both pre- and post-emergent treatments."

804	**Tolerates, or benefits from, mutilation, cultivation, or fire**	**y**

Qsn #	Question	Answer
	Source(s)	**Notes**
	Humphreys, L. R. (1991). Tropical Pasture Utilisation. Cambridge University Press. Cambridge, UK	"Ash et al. (1982) burnt a native pasture dominated by Heteropogon contortus and Bothriochloa bladhii in mid-October. The proportion of green leaf increased to a maximum of 68% in the burnt pasture in January" [Tolerates burning]
	Pengelly, B. C., Hall, E., Auricht, G., Bennell, M., & Cook, B. G. (2006). Identifying potential pasture species for grazing systems in the Mallee-Wimmera. CSIRO Sustainable Ecosystems, Canberra	"Tolerant of heavy grazing, including by sheep, adjusting growth habit to prostrate to accommodate pressure. Grazing should be managed to maintain as leafy a sward as possible, entailing increasing grazing pressure at flowering if necessary … Fire Very tolerant of fire."

805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	**n**
	Source(s)	**Notes**
	Frohlich, D. & Lau, A. 2010. New plant records from O'ahu for 2008. Bishop Museum Occasional Papers 107: 3-18	[No evidence] "Bothriochloa bladhii (Retz.) S.T.Blake New island record Australian bluestem was previously known from Moloka'i, Hawai'i (Wagner et al. 1999) Kaua'i (Herbarium Pacificum Staff 1997) and Maui (Starr et al. 2003). A forage grass and colonizer of rangeland pastures, waste areas, and other disturbed sites (Barkworth et al. 2003), this species was first collected on O'ahu at the Hawaii Agricultural Experiment Station in 1940. Material examined. O'AHU: Ridge between Kaimuhole and Alaiheihe, on ridge crest 1300 ft [396 m], K. Kawelo USARMY 79."

Summary of Risk Traits:

High Risk / Undesirable Traits
• Elevation range exceeds 1000 m, demonstrating environmental versatility
• Thrives in tropical climates
• Naturalized on Molokai, Maui, Hawaii, Oahu, and Kahoolawe (Hawaiian Islands); widely naturalized elsewhere
• A disturbance-adapted grass that may impact agriculture and possibly the natural environment
• Other Bothriochloa species are invasive
• May increase fire risk
• Shade-tolerant
• Tolerates many soil types
• Reproduces by seeds and vegetatively by rhizomes
• Hybridizes with other Bothriochloa species
• Apomictic
• Annual to perennial, capable of reaching maturity in one growing season
• Seeds dispersed by wind, intentionally and unintentionally by people, and possibly by water and animals
• Tolerates fire and heavy grazing

Low Risk Traits
• Despite naturalization and weediness, valued as a pasture grass for livestock
• Unarmed (no spines, thorns, or burrs)
• Provides forage for livestock
• Herbicides may provide effective control