

**Australia/New Zealand Weed Risk Assessment adapted for Florida.**

**Data used for analysis published in: Gordon, D.R., D.A. Onderdonk, A.M. Fox, R.K. Stocker, and C. Gantz. 2008. Predicting Invasive Plants in Florida using the Australian Weed Risk Assessment. Invasive Plant Science and Management 1: 178-195.**

<b><i>Poa annua (annual bluegrass)</i></b>			
<b>Question number</b>	<b>Question</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 Florida's USDA climate 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 habitats with periodic inundation		
2.05	Does the species have a history of repeated introductions outside its natural range?	y	
3.01	Naturalized beyond native range	y	0
3.02	Garden/amenity/disturbance weed	y	0
3.03	Weed of agriculture	y	0
3.04	Environmental weed	n	0
3.05	Congeneric weed	y	0
4.01	Produces spines, thorns or burrs	n	0
4.02	Allelopathic	n	0
4.03	Parasitic	n	0
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	y	1
4.08	Creates a fire hazard in natural ecosystems	n	0
4.09	Is a shade tolerant plant at some stage of its life cycle	y	1
4.1	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils)	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		
6.02	Produces viable seed	y	1
6.03	Hybridizes naturally	?	
6.04	Self-compatible or apomictic	y	1
6.05	Requires specialist pollinators	n	0
6.06	Reproduction by vegetative fragmentation	y?	1
6.07	Minimum generative time (years)	1	1
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y	1
7.02	Propagules dispersed intentionally by people	n	-1
7.03	Propagules likely to disperse as a produce contaminant	y	1
7.04	Propagules adapted to wind dispersal	y	1
7.05	Propagules water dispersed	y	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	y	1
8.02	Evidence that a persistent propagule bank is formed (>1 yr)	y	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 Florida, or east of the continental divide		
<b>Total Score</b>			<b>26</b>

<b>Outcome</b>	<b>Reject*</b>
----------------	----------------

\*Used secondary screen from: Daehler, C. C., J.L. Denslow, S. Ansari, and H. Kuo. 2004. A risk assessment system for screening out harmful invasive pest plants from Hawaii's and other Pacific islands. *Conserv. Biol.* 18: 360-368.

section	# questions answered	satisfy minimum?
A	7	yes
B	11	yes
C	21	yes
total	39	yes

Data collected 2006-2007

Question number	Reference	Source data
1.01		no evidence of cultivation
1.02		
1.03		
2.01	Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York.	average minimum and maximum temps, respectively: 4.9 and 27.4°C
2.02		
2.03	Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York.	" <i>P. annua</i> occurs in a multitude of habitats in over 80 countries with temperate climates and in mountainous regions of tropical countries"
2.04		
2.05	Warwick (1979) The biology of Canadian weeds. 37. <i>Poa annua</i> L. Canadian Journal of Plant Science 59: 1053-1066.	Native to Europe, now "cosmopolitan in distribution, having been reported from: Europe, North Africa, North Asia, Australia, South America and Antarctica".
3.01	Warwick (1979) The biology of Canadian weeds. 37. <i>Poa annua</i> L. Canadian Journal of Plant Science 59: 1053-1066.	Native to Europe, now "cosmopolitan in distribution, having been reported from: Europe, North Africa, North Asia, Australia, South America and Antarctica".
3.02	Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York.	"It invades gardens, lawns, foot paths, bowling greens, flower beds, golf courses, and cracks in sidewalks and pavement."
3.03	1. Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York. 2. Warwick (1979) The biology of Canadian weeds. 37. <i>Poa annua</i> L. Canadian Journal of Plant Science 59: 1053-1066.	1. " <i>P. annua</i> is a weed of 38 crops in 80 countries...and is most frequently reported as a weed of vegetables, cereals, turf, sugar beets, potatoes, and orchards." 2. " <i>Poa annua</i> is a serious weed in turfgrass."
3.04		no evidence
3.05	Weber (2003) Invasive Plant Species of the World.	<i>P. pratensis</i> considered an

	CABI Publishing.	environmental weed in Australia and parts of North America.
4.01	Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York.	no description of these traits
4.02	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	not allelopathic
4.03	Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York.	no description of this
4.04	Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York.	"palatable to livestock" [unclear whether eaten readily]
4.05	1. Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York. 2. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	1. "does not accumulate nitrates or oxalates" 2. no toxicity
4.06	Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York.	" <i>P. annua</i> may host tobacco rattle virus and <i>Xiphinema</i> or <i>Pratylenchus</i> nematodes (Bendixen et al. 1979), ergot of wheat, stripe virus of rice, and <i>Puccinia epiphylla</i> , as well as many other insects and diseases (Hutchinson and Seymour 1982)."
4.07	Warwick (1979) The biology of Canadian weeds. 37. <i>Poa annua</i> L. Canadian Journal of Plant Science 59: 1053-1066.	" <i>P. annua</i> is an important hayfever plant...and is listed in the Atlas of European allergenic pollens"
4.08		no evidence
4.09	1. Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York. 2. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	1. Mixed reports on shade tolerance of <i>P. annua</i> , but at least some studies have found it fairly well adapted to shade. 2. intermediate shade tolerance
4.1	1. Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York. 2. Warwick (1979) The biology of Canadian weeds. 37. <i>Poa annua</i> L. Canadian Journal of Plant Science 59: 1053-1066.	1. grows on a wide range of soils 2. "Annual bluegrass is found on most soil types, from sands to clays"
4.11	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	growth habit: graminoid
4.12		no evidence

5.01		terrestrial
5.02	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	Poaceae
5.03	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	nitrogen fixation: none (and herbaceous)
5.04	1. Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York. 2. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	1. roots fibrous 2. not propagated by bulbs, corms, or tubers
6.01		
6.02	Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York.	"Seeds are viable in only 1 to 2 days after pollination"
6.03	Warwick (1979) The biology of Canadian weeds. 37. <i>Poa annua</i> L. Canadian Journal of Plant Science 59: 1053-1066.	Hybrids between <i>P. annua</i> and other <i>Poa</i> species have been reported. [unclear whether they are naturally occurring hybrids or not]
6.04	1. Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York. 2. Warwick (1979) The biology of Canadian weeds. 37. <i>Poa annua</i> L. Canadian Journal of Plant Science 59: 1053-1066.	1. "plants are normally self-pollinated, with 0 to 15% outcrossing in natural populations" 2. "The species is fully self-compatible and is predominantly selfing."
6.05	Grime, Hodgson, and Hunt (1988) Comparative Plant Ecology: a Functional Approach to Common British Species. Unwin Hyman Ltd., London.	wind-pollinated; cleistogamy frequent
6.06	1. Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York. 2. Warwick (1979) The biology of Canadian weeds. 37. <i>Poa annua</i> L. Canadian Journal of Plant Science 59: 1053-1066.	1. perennial type is "semi-stoloniferous" 2. "sometimes nodally rooting"; "Since non-flowering tillers appear to have the potential of becoming established as separate individuals, vegetative reproduction is indeed important in determining the reproductive characteristics of the populations."
6.07	Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York.	"Annual types are usually erect and flower within 44 to 55 days after germination"; "Annual types of <i>P. annua</i> ...mature in 3 to 4 mo."
7.01	Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York.	seeds are "transported on shoes, tools, mowers, and other equipment"
7.02		no evidence

7.03	Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York.	<i>P. annua</i> seeds are "a common contaminant of forage crop seeds".
7.04	Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York.	seeds are dispersed by wind; "The glume serves somewhat as a wing to aid in wind dispersal"
7.05	Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York.	seeds are dispersed by water; "seeds can float in water"
7.06	Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York.	seeds are "readily spread by birds"; "birds may use the panicles to build nests"
7.07		no evidence of any means of attachment
7.08	1. Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York. 2. Warwick (1979) The biology of Canadian weeds. 37. <i>Poa annua</i> L. Canadian Journal of Plant Science 59: 1053-1066.	1. seeds are dispersed by livestock consumption 2. "Viable seeds of <i>P. annua</i> have been found in cattle dung"
8.01	Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York.	"In a golf green, the persistent component of the seed bank averaged 30,000 seeds/m <sup>2</sup> and the transient population reached 210,000/m <sup>2</sup> in the spring." [transient seeds germinate within one year so must be that year's crop]
8.02	Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York.	"In Australia, <i>P. annua</i> produces 'persistent' seeds (live more than one year) and 'transient' (germinate within one year) seeds"; "Viable seeds were present [in soil] after 5 yr, especially in the untilled soil."
8.03	1. Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York. 2. Warwick (1979) The biology of Canadian weeds. 37. <i>Poa annua</i> L. Canadian Journal of Plant Science 59: 1053-1066.	1. several herbicide-resistant biotypes have evolved 2. No herbicides will selectively control <i>P. annua</i> , but bensulide and chlorthal dimethyl are popular preemergence herbicides, and endothal, linuron, and tricalcium arsenate are some of the most widely used postemergence herbicides.
8.04	Holm, Doll, Holm, Pancho, and Herberger (1997) World weeds: natural histories and distribution. John Wiley & Sons, New York.	survives after uprooting; tolerates trampling and close mowing
8.05		