

Key Words: High Risk, Naturalized, Environmental Weed, Fodder Grass, Wind-dispersed

**Family:** *Poaceae*

**Taxon:** *Piptatherum miliaceum*

**Synonym:** *Agrostis miliacea* L. (basionym)

*Oryzopsis miliacea* (L.) Benth. & Hook. f. ex.

**Common Name:** rice millet

smilo

smilo grass

**Questionnaire :** current 20090513  
**Status:** Assessor Approved

**Assessor:** Patti Clifford  
**Data Entry Person:** Patti Clifford

**Designation:** H(HPWRA)

**WRA Score 7**

101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?	y=1, n=-1	
103	Does the species have weedy races?	y=1, n=-1	
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)	Intermediate
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	
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	n
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)	n
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	y
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	n
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic	y=1, n=0	
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals	y=1, n=-1	n
405	Toxic to animals	y=1, n=0	n
406	Host for recognized pests and pathogens	y=1, n=0	
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	
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	

411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	n
501	Aquatic	y=5, n=0	
502	Grass	y=1, n=0	y
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
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally	y=1, n=-1	
604	Self-compatible or apomictic	y=1, n=-1	
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	n
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	
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
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	
704	Propagules adapted to wind dispersal	y=1, n=-1	y
705	Propagules water dispersed	y=1, n=-1	y
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	y
708	Propagules survive passage through the gut	y=1, n=-1	
801	Prolific seed production (>1000/m2)	y=1, n=-1	
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	
803	Well controlled by herbicides	y=-1, n=1	
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	

Designation: H(HPWRA)

WRA Score **7**

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**Supporting Data:**

101	2012. WRA Specialist. Personal Communication.	[Is the species highly domesticated? No] No evidence of domestication that reduces invasive traits.
102	2012. WRA Specialist. Personal Communication.	[Has the species become naturalized where grown? NA]
103	2012. WRA Specialist. Personal Communication.	[Does the species have weedy races? NA]
201	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	[Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"? 1 - Intermediate] Native range: Portugal - Madeira Islands; Spain - Canary Islands; Algeria; Egypt; Libya; Morocco; Tunisia; Cyprus; Egypt - Sinai; Iraq; Israel; Jordan; Lebanon; Syria; Turkey; Albania; Former Yugoslavia; Greece; Italy; France; Portugal; Spain.
202	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	[Quality of climate match data? 2 - high ] Native range: Portugal - Madeira Islands; Spain - Canary Islands; Algeria; Egypt; Libya; Morocco; Tunisia; Cyprus; Egypt - Sinai; Iraq; Israel; Jordan; Lebanon; Syria; Turkey; Albania; Former Yugoslavia; Greece; Italy; France; Portugal; Spain.
203	2012. Calflora. Calflora Database Piptatherum miliaceum. <a href="http://www.calflora.org/cgi-bin/species_query.cgi?where-calrecnum=6539">http://www.calflora.org/cgi-bin/species_query.cgi?where-calrecnum=6539</a>	[Broad climate suitability (environmental versatility)? ] Elevation between 0 and 984 feet in California.
204	2008. The Bishop Museum. Native and naturalized flowering plants of Hawaii - main Hawaiian Islands. The Bishop Museum, <a href="http://www.bishopmuseum.org/research/natsci/botany/dbandkeys/Main%20Islands%20Report.pdf">http://www.bishopmuseum.org/research/natsci/botany/dbandkeys/Main%20Islands%20Report.pdf</a>	[Native or naturalized in regions with tropical or subtropical climates? Yes] Naturalized on Hawaii.
205	2012. WRA Specialist. Personal Communication.	[Does the species have a history of repeated introductions outside its natural range? No] No evidence of repeated introductions.
301	2008. The Bishop Museum. Native and naturalized flowering plants of Hawaii - main Hawaiian Islands. The Bishop Museum, <a href="http://www.bishopmuseum.org/research/natsci/botany/dbandkeys/Main%20Islands%20Report.pdf">http://www.bishopmuseum.org/research/natsci/botany/dbandkeys/Main%20Islands%20Report.pdf</a>	[Naturalized beyond native range? Yes] Naturalized on the Big Island (Hawaii).
301	2012. Prigge, B.A./Gibson, A.C.. Stipa L. Needlegrass. University of California Los Angeles, Santa Monica <a href="http://www.google.com/url?sa=t&amp;rct=j&amp;q=&amp;esrc=s&amp;source=web&amp;cd=10&amp;ved=0CFkQFjAJ&amp;url=http%3A%2F%2Fwww.eeb.ucla.edu%2FFaculty%2FGibson%2FSanta_Monica_Mou">http://www.google.com/url?sa=t&amp;rct=j&amp;q=&amp;esrc=s&amp;source=web&amp;cd=10&amp;ved=0CFkQFjAJ&amp;url=http%3A%2F%2Fwww.eeb.ucla.edu%2FFaculty%2FGibson%2FSanta_Monica_Mou</a>	[Naturalized beyond native range? Yes] Naturalized in California in southern oak woodland, along trails through chaparral, and often colonizing wet road cuts and along streams, but also weedy along roadsides in urbanized areas.
302	2002. Mallet, K./Orchard, A.E.. Poaceae 1: introduction and atlas, volume 1 volume 43 of flora of Australia. Csiro Publishing,	[Garden/amenity/disturbance weed?] Introduced weed, common and widespread on roadsides, creek banks and in damp shaded waste areas.
302	2012. WRA Specialist. Personal Communication.	[Garden/amenity/disturbance weed? No] Scored as an environmental weed.
303	2012. WRA Specialist. Personal Communication.	[Agricultural/forestry/horticultural weed? No] No evidence of negative impacts and control efforts in these systems.
304	1992. Carr, G.W./Yugovic, J.V./Robinson, K.E.. Environmental weed invasions in Victoria conservation and management implications. Department of Conservation and Environment, East Melbourne	[Environmental weed? Yes] Potential threat to these vegetation formation types in Victoria: dry coastal vegetation, lowland grassland & grassy woodland, dry sclerophyll forest & woodland, riparian vegetation, rock outcrop vegetation.
305	2007. Randall, R.P.. Global Compendium of Weeds - Index. <a href="http://www.hear.org/gcw/">http://www.hear.org/gcw/</a>	[Congeneric weed? No] No evidence.
401	2012. Barkworth, M.E.. Piptatherum. University of Utah Herbarium, <a href="http://herbarium.usu.edu/webmanual/info2.asp?name=Piptatherum_pungens&amp;type=treatment">http://herbarium.usu.edu/webmanual/info2.asp?name=Piptatherum_pungens&amp;type=treatment</a>	[Produces spines, thorns or burrs? No] "Plants perennial; cespitose or soboliferous, sometimes rhizomatous. Culms 10–140(150) cm, erect, usually glabrous, usually smooth; nodes 1–6; branching intra- or extravaginal at the base, not branching above the base; prophylls concealed by the leaf sheaths. Leaves sometimes basally concentrated; cleistogenes not present; sheaths open, glabrous, smooth to scabrous; auricles absent; ligules 0.2–15 mm, membranous to hyaline; blades 0.5–16 mm wide, flat, involute, valvate, or folded, often tapering in the distal 1/3, apices acute to acuminate, not stiff, basal blades not overwintering, sometimes not developed, flag leaf blades well developed, longer than 1 cm."

402	2012. WRA Specialist. Personal Communication.	[Allelopathic? Unknown]
403	2012. Barkworth, M.E.. Piptatherum. University of Utah Herbarium, <a href="http://herbarium.usu.edu/webmanual/info2.asp?name=Piptatherum_pungens&amp;type=treatment">http://herbarium.usu.edu/webmanual/info2.asp?name=Piptatherum_pungens&amp;type=treatment</a>	[Parasitic? No] Poaceae.
404	2012. Agriculture and Agri-Food Canada. Plant Gene Resources of Canada - Piptatherum miliaceum (L.) Coss.. <a href="http://pgrc3.agr.ca/cgi-bin/npgs/html/taxon.pl?317150">http://pgrc3.agr.ca/cgi-bin/npgs/html/taxon.pl?317150</a>	[Unpalatable to grazing animals? No] Animal fodder.
404	2012. Barkworth, M.E.. Piptatherum. University of Utah Herbarium, <a href="http://herbarium.usu.edu/webmanual/info2.asp?name=Piptatherum_pungens&amp;type=treatment">http://herbarium.usu.edu/webmanual/info2.asp?name=Piptatherum_pungens&amp;type=treatment</a>	[Unpalatable to grazing animals? No] Used as a fodder in Africa.
405	2012. National Center for Biotechnology Information. PubMed. <a href="http://www.ncbi.nlm.nih.gov/sites/entrez">http://www.ncbi.nlm.nih.gov/sites/entrez</a>	[Toxic to animals? No] No evidence.
405	2012. Specialized Information Services, U.S. National Library of Medicine. TOXNET toxicology data network [online database]. National Institutes of Health, <a href="http://toxnet.nlm.nih.gov/">http://toxnet.nlm.nih.gov/</a>	[Toxic to animals? No] No evidence.
406	2012. WRA Specialist. Personal Communication.	[Host for recognized pests and pathogens? Unknown]
407	2012. National Center for Biotechnology Information. PubMed. <a href="http://www.ncbi.nlm.nih.gov/sites/entrez">http://www.ncbi.nlm.nih.gov/sites/entrez</a>	[Causes allergies or is otherwise toxic to humans? No] No evidence.
407	2012. Specialized Information Services, U.S. National Library of Medicine. TOXNET toxicology data network [online database]. National Institutes of Health, <a href="http://toxnet.nlm.nih.gov/">http://toxnet.nlm.nih.gov/</a>	[Causes allergies or is otherwise toxic to humans? No] No evidence.
408	2012. WRA Specialist. Personal Communication.	[Creates a fire hazard in natural ecosystems? Unknown]
409	2012. Dave's Garden. PlantFiles: Piptatherum miliaceum. <a href="http://davesgarden.com/guides/pf/go/189260/">http://davesgarden.com/guides/pf/go/189260/</a>	[Is a shade tolerant plant at some stage of its life cycle? Yes] Sun to partial shade; light shade.
410	2012. Dave's Garden. PlantFiles: Piptatherum miliaceum. <a href="http://davesgarden.com/guides/pf/go/189260/">http://davesgarden.com/guides/pf/go/189260/</a>	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)?] Soil pH requirements: 6.1 to 6.5 (mildly acidic) 6.6 to 7.5 (neutral) 7.6 to 7.8 (mildly alkaline)
411	2002. Brown, K./Brooks, K.. Bushland Weeds. A practical guide to their management With case studies from the Swan Coastal Plain and beyond. Environmental Weeds Action Network, Greenwood, Australia	[Climbing or smothering growth habit? No] Poaceae.
412	2012. WRA Specialist. Personal Communication.	[Forms dense thickets? No] No evidence.
502	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	[Grass? Yes] Poaceae.
503	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	[Nitrogen fixing woody plant? No] Poaceae.
504	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] Poaceae.
601	2012. WRA Specialist. Personal Communication.	[Evidence of substantial reproductive failure in native habitat? No] No evidence.

602	2002. Brown, K./Brooks, K.. Bushland Weeds. A practical guide to their management With case studies from the Swan Coastal Plain and beyond. Environmental Weeds Action Network, Greenwood, Australia	[Produces viable seed? Yes] Reproduces by seed.
603	2012. WRA Specialist. Personal Communication.	[Hybridizes naturally? Unknown]
604	2012. WRA Specialist. Personal Communication.	[Self-compatible or apomictic? Unknown]
605	1998. Shukla, A.K./Vijayaraghavan, M.R./Chaudhry, B.. Biology of pollen. APH Publishing, <a href="http://books.google.com/books?id=jfSlwa0BnDgC&amp;pg=PA67&amp;lpg=PA67&amp;dq=poaceae+%2B+%22pollination%22&amp;source=bl&amp;ots=_qpKMO8XRG&amp;sig=J8YBXliT02d4e0fZ0LQ77f8VVMU&amp;hl=en&amp;sa=X&amp;e">http://books.google.com/books?id=jfSlwa0BnDgC&amp;pg=PA67&amp;lpg=PA67&amp;dq=poaceae+%2B+%22pollination%22&amp;source=bl&amp;ots=_qpKMO8XRG&amp;sig=J8YBXliT02d4e0fZ0LQ77f8VVMU&amp;hl=en&amp;sa=X&amp;e</a>	[Requires specialist pollinators? No] Wind pollinated.
606	2002. Brown, K./Brooks, K.. Bushland Weeds. A practical guide to their management With case studies from the Swan Coastal Plain and beyond. Environmental Weeds Action Network, Greenwood, Australia	[Reproduction by vegetative fragmentation? No] Reproduces by seed.
607	2012. WRA Specialist. Personal Communication.	[Minimum generative time (years)? Unknown]
701	2012. Prigge, B.A./Gibson, A.C.. Stipa L. Needlegrass. University of California Los Angeles, Santa Monica <a href="http://www.google.com/url?sa=t&amp;rct=j&amp;q=&amp;esrc=s&amp;source=web&amp;cd=10&amp;ved=0CFkQFjAJ&amp;url=http%3A%2F%2Fwww.eeb.ucla.edu%2FFaculty%2FGibson%2FSanta_Monica_Mou">http://www.google.com/url?sa=t&amp;rct=j&amp;q=&amp;esrc=s&amp;source=web&amp;cd=10&amp;ved=0CFkQFjAJ&amp;url=http%3A%2F%2Fwww.eeb.ucla.edu%2FFaculty%2FGibson%2FSanta_Monica_Mou</a>	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? Yes] Naturalized in California in southern oak woodland, along trails through chaparral, and often colonizing wet road cuts and along streams, but also weedy along roadsides in urbanized areas.
702	2012. Agriculture and Agri-Food Canada. Plant Gene Resources of Canada - Piptatherum miliaceum (L.) Coss.. <a href="http://pgrc3.agr.ca/cgi-bin/npgs/html/taxon.pl?317150">http://pgrc3.agr.ca/cgi-bin/npgs/html/taxon.pl?317150</a>	[Propagules dispersed intentionally by people? Yes] Environmental uses: erosion control, revegetation.
703	2012. Agriculture and Agri-Food Canada. Plant Gene Resources of Canada - Piptatherum miliaceum (L.) Coss.. <a href="http://pgrc3.agr.ca/cgi-bin/npgs/html/taxon.pl?317150">http://pgrc3.agr.ca/cgi-bin/npgs/html/taxon.pl?317150</a>	[Propagules likely to disperse as a produce contaminant?] Potential seed contaminant.
704	1992. Carr, G.W./Yugovic, J.V./Robinson, K.E.. Environmental weed invasions in Victoria conservation and management implications. Department of Conservation and Environment, East Melbourne	[Propagules adapted to wind dispersal? Yes] Dispersed by wind, water, externally on animals.
705	1992. Carr, G.W./Yugovic, J.V./Robinson, K.E.. Environmental weed invasions in Victoria conservation and management implications. Department of Conservation and Environment, East Melbourne	[Propagules water dispersed? Yes] Water dispersed in Victoria, Australia.
706	1992. Carr, G.W./Yugovic, J.V./Robinson, K.E.. Environmental weed invasions in Victoria conservation and management implications. Department of Conservation and Environment, East Melbourne	[Propagules bird dispersed? No] Wind, water, animal dispersal.
707	1992. Carr, G.W./Yugovic, J.V./Robinson, K.E.. Environmental weed invasions in Victoria conservation and management implications. Department of Conservation and Environment, East Melbourne	[Propagules dispersed by other animals (externally)? Yes] Dispersed by wind, water and externally on animals.
708	2012. WRA Specialist. Personal Communication.	[Propagules survive passage through the gut? Unknown]
801	2012. WRA Specialist. Personal Communication.	[Prolific seed production (>1000/m <sup>2</sup> )? Unknown]
802	2012. WRA Specialist. Personal Communication.	[Evidence that a persistent propagule bank is formed (>1 yr)? Unknown]

803	2012. WRA Specialist. Personal Communication.	[Well controlled by herbicides? Unknown]
804	2004. Nevo, E./Vasser, S. P.. Evolutionary Theory and Processes: Modern horizons: papers in honour of Eviatar Nevo. Springer, <a href="http://books.google.com/books?id=tJeZC885-OcC&amp;dq=piptatherum+miliaceum+%2B+%22fire%22&amp;source=gbs_navlinks_s">http://books.google.com/books?id=tJeZC885-OcC&amp;dq=piptatherum+miliaceum+%2B+%22fire%22&amp;source=gbs_navlinks_s</a>	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes] Piptatherum is distinguished by its great regeneration capabilities after fire.
804	2007. Naveh, Z.. Transdisciplinary challenges in landscape ecology and restoration ecology. Springer,	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes] " In certain perennial grasses, an additional regeneration mechanism is provided by reactivation of intercalary meristem and axillary buds along the charred culms. Among these, Piptatherum miliaceum is the most prominent pyrophyte, increasing germination from seeds, heated to 90 degrees Celsius.
805	2012. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol agents)? Unknown]

## **Summary of Risk Traits**

### **High Risk / Undesirable Traits**

- Native distribution includes subtropical region
- Naturalized on Hawaii
- Weed of disturbed and riparian areas
- Environmental weed
- Shade tolerant
- Wind pollinated
- Potential seed contaminant
- Unintentional dispersal by human actions
- Dispersed by wind, water and animals
- Regenerates after fire

### **Low Risk / Desirable Traits**

- Foliage palatable to deer and other browsing animals
- Relatively shade intolerant
- Self-incompatible
- Landscaping and ornamental value
- Herbicides may provide effective control