

Assessment date 10 July 2017

<b><i>Alternanthera pungens</i> South &amp; Central ZONES</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) North Zone: suited to Zones 8, 9 Central Zone: suited to Zones 9, 10 South Zone: suited to Zone 10	2	
2.02	Quality of climate match data (0-low; 1-intermediate; 2-high)	2	
2.03	Broad climate suitability (environmental versatility)		
2.04	Native or naturalized in habitats with periodic inundation North Zone: mean annual precipitation 50-70 inches Central Zone: mean annual precipitation 40-60 inches South Zone: mean annual precipitation 40-60 inches	y	1
2.05	Does the species have a history of repeated introductions outside its natural range?	y	
3.01	Naturalized beyond native range	y	2
3.02	Garden/amenity/disturbance weed	y	2
3.03	Weed of agriculture	unk	
3.04	Environmental weed	y	4
3.05	Congeneric weed	y	2
4.01	Produces spines, thorns or burrs	y	1
4.02	Allelopathic	unk	0
4.03	Parasitic	n	0
4.04	Unpalatable to grazing animals	?	
4.05	Toxic to animals	y	1
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	n	0
4.10	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils). North & Central Zones: infertile soils; South Zone: shallow limerock or Histisols.	unk	0
4.11	Climbing or smothering growth habit	n	0
4.12	Forms dense thickets	n	0
5.01	Aquatic	n	0
5.02	Grass	n	0
5.03	Nitrogen fixing woody plant	n	0
5.04	Geophyte	y	1

6.01	Evidence of substantial reproductive failure in native habitat	n	0
6.02	Produces viable seed	y	1
6.03	Hybridizes naturally	unk	-1
6.04	Self-compatible or apomictic	unk	-1
6.05	Requires specialist pollinators	unk	0
6.06	Reproduction by vegetative propagation	y	1
6.07	Minimum generative time (years)	unk	-1
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y	1
7.02	Propagules dispersed intentionally by people	unk	-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)	y	1
7.08	Propagules dispersed by other animals (internally)	unk	-1
8.01	Prolific seed production	unk	-1
8.02	Evidence that a persistent propagule bank is formed (>1 yr)	?	
8.03	Well controlled by herbicides	y	-1
8.04	Tolerates, or benefits from, mutilation or cultivation	y	1
8.05		?	
<b>Total Score</b>		<b>18</b>	
<b>Implemented Pacific Second Screening</b>		<b>NO</b>	
<b>Risk Assessment Results</b>		<b>High</b>	

section	# questions answered	satisfy minimum?
A		9 yes
B		9 yes
C		15 yes
total		33 yes

Assessment date 10 July 2017

<b><i>Alternanthera pungens</i> North ZONES</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) North Zone: suited to Zones 8, 9 Central Zone: suited to Zones 9, 10 South Zone: suited to Zone 10	1	
2.02	Quality of climate match data (0-low; 1-intermediate; 2-high)	2	
2.03	Broad climate suitability (environmental versatility)		
2.04	Native or naturalized in habitats with periodic inundation North Zone: mean annual precipitation 50-70 inches Central Zone: mean annual precipitation 40-60 inches South Zone: mean annual precipitation 40-60 inches	y	1
2.05	Does the species have a history of repeated introductions outside its natural range?	y	
3.01	Naturalized beyond native range	y	2
3.02	Garden/amenity/disturbance weed	y	2
3.03	Weed of agriculture	unk	
3.04	Environmental weed	y	4
3.05	Congeneric weed	y	2
4.01	Produces spines, thorns or burrs	y	1
4.02	Allelopathic	unk	0
4.03	Parasitic	n	0
4.04	Unpalatable to grazing animals	?	
4.05	Toxic to animals	y	1
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	n	0
4.10	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils). North & Central Zones: infertile soils; South Zone: shallow limerock or Histisols.	unk	0
4.11	Climbing or smothering growth habit	n	0
4.12	Forms dense thickets	n	0
5.01	Aquatic	n	0
5.02	Grass	n	0
5.03	Nitrogen fixing woody plant	n	0
5.04	Geophyte	y	1

6.01	Evidence of substantial reproductive failure in native habitat	n	0
6.02	Produces viable seed	y	1
6.03	Hybridizes naturally	unk	-1
6.04	Self-compatible or apomictic	unk	-1
6.05	Requires specialist pollinators	unk	0
6.06	Reproduction by vegetative propagation	y	1
6.07	Minimum generative time (years)	unk	-1
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y	1
7.02	Propagules dispersed intentionally by people	unk	-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)	y	1
7.08	Propagules dispersed by other animals (internally)	unk	-1
8.01	Prolific seed production	unk	-1
8.02	Evidence that a persistent propagule bank is formed (>1 yr)	?	
8.03	Well controlled by herbicides	y	-1
8.04	Tolerates, or benefits from, mutilation or cultivation	y	1
8.05		?	
<b>Total Score</b>			<b>13</b>
<b>Implemented Pacific Second Screening</b>			<b>NO</b>
<b>Risk Assessment Results</b>			<b>High</b>

section	# questions answered	satisfy minimum?
A		9 yes
B		9 yes
C		15 yes
total		33 yes

	Reference	Source data
1.01		Cultivated, but no evidence of selection for reduced weediness
1.02		Skip to question 2.01
1.03		Skip to question 2.01
2.01	<p>1. Global Plant Hardiness Zones for Phytosanitary Risk Analysis. <a href="http://naldc.nal.usda.gov/download/36586/PDF">http://naldc.nal.usda.gov/download/36586/PDF</a> (Accessed: 15 November 2016) 2. Queensland Government. <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm</a> (Accessed: 15 November 2016) 3. US National Plant Germplasm System. <a href="https://npgsweb.ars-grin.gov/gringlobal/taxonomydetail.aspx?316546">https://npgsweb.ars-grin.gov/gringlobal/taxonomydetail.aspx?316546</a> (Accessed: 30 November 2016) 4. The National Gardening Association Plants Database. <a href="https://garden.org/plants/view/170754/Khakiweed-Alternanthera-pungens/">https://garden.org/plants/view/170754/Khakiweed-Alternanthera-pungens/</a> (Accessed: 1 December 2016)</p>	<p>1. Figure 3. Florida North Zone: Hardiness zones 8 and 9. Central Zone: Hardiness zones 9 and 10. South Zone: Hardiness zone 10. 2. "Native to South America (i.e. Venezuela, Brazil, Ecuador and Peru)"; "Widely distributed throughout all the mainland states and territories of Australia, where it grows in all but the driest environments, but is predominantly found in and around towns. Particularly common and widespread in New South Wales and Queensland, and relatively widespread in the Northern Territory and in the northern and western parts of Western Australia. Also naturalised in many parts of South Australia, in northern Victoria, in the ACT and on Christmas Island. Widely naturalised in other parts of the world, including in northern Africa, Asia (i.e. China, Bhutan, Myanmar, Thailand and Papua New Guinea) and on some Pacific islands (i.e. Hawaii and New Caledonia)." 3. Native to Southern America: Brazil, Venezuela, Ecuador, and Peru. 4. Zone 9 to 11</p>
2.02		Native range well know.
2.03	<p>1. The University of Melbourne. Köppen-Geiger Climate Map of the Wolrd. <a href="http://people.eng.unimelb.edu.au/mpeel/koppen.html">http://people.eng.unimelb.edu.au/mpeel/koppen.html</a> (Accessed: 15 November 2016) 2. Queensland Government. <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm</a> (Accessed: 15 November 2016) 3. US National Plant Germplasm System. <a href="https://npgsweb.ars-grin.gov/gringlobal/taxonomydetail.aspx?316546">https://npgsweb.ars-grin.gov/gringlobal/taxonomydetail.aspx?316546</a> (Accessed: 30 November 2016)</p>	<p>1. Native or naturalized to Köppen-Geiger Climate Zones: Af, Am, Aw, BWh, BWk, and BSh 2. "Native to South America (i.e. Venezuela, Brazil, Ecuador and Peru)"; "Widely distributed throughout all the mainland states and territories of Australia, where it grows in all but the driest environments, but is predominantly found in and around towns. Particularly common and widespread in New South Wales and Queensland, and relatively widespread in the Northern Territory and in the northern and western parts of Western Australia. Also naturalised in many parts of South Australia, in northern Victoria, in the ACT and on Christmas Island. Widely naturalised in other parts of the world, including in northern Africa, Asia (i.e. China, Bhutan, Myanmar, Thailand and Papua New Guinea) and on some Pacific islands (i.e. Hawaii and New Caledonia)." 3. Native to Southern America: Brazil, Venezuela, Ecuador, and Peru.</p>

2.04	<p>1. Climate Charts. World Climate Maps. <a href="http://www.climate-charts.com/World-Climate-Maps.html#rain">http://www.climate-charts.com/World-Climate-Maps.html#rain</a> (Accessed: 15 November 2016) 2. Queensland Government. <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm</a> (Accessed: 15 November 2016) 3. US National Plant Germplasm System. <a href="https://npgsweb.ars-grin.gov/gringlobal/taxonomydetail.aspx?316546">https://npgsweb.ars-grin.gov/gringlobal/taxonomydetail.aspx?316546</a> (Accessed: 30 November 2016)</p>	<p>1. Native and naturalized in areas with rainfall within these ranges. 2. "Native to South America (i.e. Venezuela, Brazil, Ecuador and Peru)"; "Widely distributed throughout all the mainland states and territories of Australia, where it grows in all but the driest environments, but is predominantly found in and around towns. Particularly common and widespread in New South Wales and Queensland, and relatively widespread in the Northern Territory and in the northern and western parts of Western Australia. Also naturalised in many parts of South Australia, in northern Victoria, in the ACT and on Christmas Island. Widely naturalised in other parts of the world, including in northern Africa, Asia (i.e. China, Bhutan, Myanmar, Thailand and Papua New Guinea) and on some Pacific islands (i.e. Hawaii and New Caledonia)." 3. Native to Southern America: Brazil, Venezuela, Ecuador, and Peru.</p>
2.05	<p>1. USDA Plants Database. <a href="http://plants.usda.gov/core/profile?symbol=Alpu3">http://plants.usda.gov/core/profile?symbol=Alpu3</a> (Accessed: 15 November 2016) 2. Queensland Government. <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm</a> (Accessed: 15 November 2016) 3. Pacific Island Ecosystems at Risk. <a href="http://www.hear.org/pier/species/alternanthera_pungens.htm">http://www.hear.org/pier/species/alternanthera_pungens.htm</a> (Accessed: 30 November 2016) 4. GoBotany. <a href="https://gobotany.newenglandwild.org/species/alternanthera/pungens/">https://gobotany.newenglandwild.org/species/alternanthera/pungens/</a> (Accessed: 30 November 2016) 5. Pacific Island Ecosystems at Risk. <a href="http://www.hear.org/pier/species/alternanthera_pungens.htm">http://www.hear.org/pier/species/alternanthera_pungens.htm</a> (Accessed: 30 November 2016)</p>	<p>1. See map. Introduced to the US. 2. "Widely distributed throughout all the mainland states and territories of Australia, where it grows in all but the driest environments, but is predominantly found in and around towns. Particularly common and widespread in New South Wales and Queensland, and relatively widespread in the Northern Territory and in the northern and western parts of Western Australia. Also naturalised in many parts of South Australia, in northern Victoria, in the ACT and on Christmas Island. Widely naturalised in other parts of the world, including in northern Africa, Asia (i.e. China, Bhutan, Myanmar, Thailand and Papua New Guinea) and on some Pacific islands (i.e. Hawaii and New Caledonia)." 3. Introduced to Hawaii, New Caledonia, Papua New Guinea, Australia, and China. 4. Present in Massachusetts 5. Introduced to Hawaii, New Caledonia, Papua New Guinea, Australia, and China</p>
3.01	<p>1. Queensland Government. <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm</a> (Accessed: 15 November 2016) 2. Smithsonian National Museum of Natural History. <a href="http://botany.si.edu/pacificislandbiodiversity/hawaiianflora/result2.cfm?genus=Alternanthera&amp;species=pungens&amp;rank1=&amp;epithet1=">http://botany.si.edu/pacificislandbiodiversity/hawaiianflora/result2.cfm?genus=Alternanthera&amp;species=pungens&amp;rank1=&amp;epithet1=</a> (Accessed: 15 November 2016) 3. Useful Tropical Plants. <a href="http://tropical.theferns.info/viewtropical.php?id=Alternanthera+pungens">http://tropical.theferns.info/viewtropical.php?id=Alternanthera+pungens</a> (Accessed: 15 November 2016) 4. Flora of China. <a href="http://www.efloras.org/florataxon.aspx?flora_id=2&amp;taxon_id=200006976">http://www.efloras.org/florataxon.aspx?flora_id=2&amp;taxon_id=200006976</a> (Accessed: 15 November 2016) 5. Flowers of India. <a href="https://www.flowersofindia.net/catalog/slides/Khaki%20Weed.html">https://www.flowersofindia.net/catalog/slides/Khaki%20Weed.html</a> (Accessed: 30 November 2016)</p>	<p>1. "Widely distributed throughout all the mainland states and territories of Australia, where it grows in all but the driest environments, but is predominantly found in and around towns. Particularly common and widespread in New South Wales and Queensland, and relatively widespread in the Northern Territory and in the northern and western parts of Western Australia. Also naturalised in many parts of South Australia, in northern Victoria, in the ACT and on Christmas Island. Widely naturalised in other parts of the world, including in northern Africa, Asia (i.e. China, Bhutan, Myanmar, Thailand and Papua New Guinea) and on some Pacific islands (i.e. Hawaii and New Caledonia)." 2. Naturalized in Hawaii 3. "Naturalized on waste land, dockyards and roadsides in lowland areas near the coast in New Guinea." 4. "naturalized in Bhutan, Myanmar, Thailand, other parts of Indo-China, Australia, and United States" 5. "naturalized in India"</p>

3.02	<p>1. Queensland Government. <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm</a> (Accessed: 30 November 2016) 2. Agriculture Victoria. <a href="http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed">http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed</a> (Accessed: 30 November 2016) 3. Northern Territory Government. <a href="https://nt.gov.au/environment/weeds/list-of-declared-weeds-in-the-nt/khaki-weed">https://nt.gov.au/environment/weeds/list-of-declared-weeds-in-the-nt/khaki-weed</a> (Accessed: 30 November 2016) 4. National Parks Service. Haleakala National Park Invasive Plant Field Guide. <a href="https://science.nature.nps.gov/im/units/pacn/assets/docs/Invasive_Species_Cards_and_Calendar_PBIN/NPS_CARDS_HALE_12_112012_final.pdf">https://science.nature.nps.gov/im/units/pacn/assets/docs/Invasive_Species_Cards_and_Calendar_PBIN/NPS_CARDS_HALE_12_112012_final.pdf</a> (Accessed: 1 December 2016) 5. Global Compendium of Weeds. <a href="http://www.hear.org/gcw/species/alternanthera_pungens/">http://www.hear.org/gcw/species/alternanthera_pungens/</a> (Accessed: 1 December 2016)</p>	<p>1. "Khaki weed (<i>Alternanthera pungens</i>) is mainly regarded as a weed of lawns, pastures and disturbed sites near habitation." 2. "Khaki weed occasionally establishes in native pastures where it out-competes other native species. Its presence has a major impact on ground flora." 3. Declared a class B and C weed of the Northern Territory of Australia 4. "Native to South America, khaki weed has become a pest throughout the tropics. In Hawaii, it has become established on all islands except Kaho'olawe and Ni'ihau. It thrives in pastures, lawns, roadsides, trails, and any disturbed natural areas. This plant has become widespread in the lower elevation areas of Maui including many beach parks and neighborhood lawns. Haleakalā National Park visitors may accidentally transport seeds to the park, where it can become problematic at all elevations." 5. Classified as a garden thug and noxious weed</p>
3.03	<p>1. Global Compendium of Weeds. <a href="http://www.hear.org/gcw/species/alternanthera_pungens/">http://www.hear.org/gcw/species/alternanthera_pungens/</a> (Accessed: 1 December 2016)</p>	<p>1. Classified as an agricultural weed, but no other information available/found.</p>
3.04	<p>1. Queensland Government. <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm</a> (Accessed: 30 November 2016) 2. Agriculture Victoria. <a href="http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed">http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed</a> (Accessed: 30 November 2016) 3. Northern Territory Government. <a href="https://nt.gov.au/environment/weeds/list-of-declared-weeds-in-the-nt/khaki-weed">https://nt.gov.au/environment/weeds/list-of-declared-weeds-in-the-nt/khaki-weed</a> (Accessed: 30 November 2016) 4. Global Compendium of Weeds. <a href="http://www.hear.org/gcw/species/alternanthera_pungens/">http://www.hear.org/gcw/species/alternanthera_pungens/</a> (Accessed: 1 December 2016) 5. Texas A&amp;M AgriLife Extension. <a href="http://wichita.agrilife.org/files/2013/08/Khaki-weed.pdf">http://wichita.agrilife.org/files/2013/08/Khaki-weed.pdf</a> (Accessed: 1 December 2016)</p>	<p>1. "However, this species is also regarded as an environmental weed in large parts of northern Australia (i.e. in northern Queensland, the Northern Territory and northern Western Australia. In fact, during a recent survey, it was listed as a priority environmental weed in five Natural Resource Management regions throughout Australia. This species initially tends to be found along roadsides and in other highly disturbed sites. However, it can spread from these areas into disturbed natural environments and occasionally invades native pastures on sandy soils, where it out-competes most other species with its mat-forming habit." 2. "Khaki weed occasionally establishes in native pastures where it out-competes other native species. Its presence has a major impact on ground flora." 3. Declared a class B and C weed of the Northern Territory of Australia 4. Classified as an environmental weed 5. "The creeping form of this plant allows it to beat out desirable plants, like turf grass."</p>
3.05	<p>1. Global Compendium of Weeds. <a href="http://www.hear.org/gcw/scientificnames/scinamea.htm">http://www.hear.org/gcw/scientificnames/scinamea.htm</a> (Accessed: 1 December 2016) 2. Texas Invasives. <a href="http://texasinvasives.org/plant_database/detail.php?symbol=ALPH">http://texasinvasives.org/plant_database/detail.php?symbol=ALPH</a> (Accessed: 1 December 2016) 3. Canadian Food Inspection Agency. <a href="http://www.inspection.gc.ca/plants/plant-pests-invasive-species/invasive-plants/fact-sheets/sessile-joyweed/eng/1331814440546/1331814543527">http://www.inspection.gc.ca/plants/plant-pests-invasive-species/invasive-plants/fact-sheets/sessile-joyweed/eng/1331814440546/1331814543527</a> (Accessed: 1 December 2016)</p>	<p>1. <i>Alternanthera philoxeroides</i> and <i>Alternanthera sessilis</i> classified as a noxious weed 2. "[<i>Alternanthera philoxeroides</i>] Alligatorweed forms thick mats that crowd out native aquatic vegetation, retard water flow, lower dissolved oxygen levels, and increase sedimentation. Flooding may result from impeded drainage. Can restrict water flow for irrigation. Inhibits fishing." 3. "[<i>Alternanthera sessilis</i>] Sessile joyweed is an invasive plant that competes with crops for valuable nutrients and water. It reduces the yield and quality of crops such as corn, rice, soybeans and vegetables. It grows in both wet and dry environments. In aquatic systems, it can block irrigation pipes and canals."</p>

4.01	<p>1. Queensland Government. <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm</a> (Accessed: 30 November 2016)</p> <p>2. Agriculture Victoria. <a href="http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed">http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed</a> (Accessed: 30 November 2016)</p> <p>3. Central Queensland Coast Landscape Network. <a href="http://www.cqclandcarenetwork.org.au/plants-database/alternanthera-pungens">http://www.cqclandcarenetwork.org.au/plants-database/alternanthera-pungens</a> (Accessed: 1 December 2016)</p> <p>4. European and Mediterranean Plant Protection Organization. <a href="https://www.eppo.int/QUARANTINE/data_sheets/plants/Alternanthera_pungens.doc">https://www.eppo.int/QUARANTINE/data_sheets/plants/Alternanthera_pungens.doc</a> (Accessed: 1 December 2016)</p>	<p>1. "some of the flower parts become hardened and form sharp prickles as they mature." 2. "The sharp spines of the khaki weed's heads are a great annoyance to bare-footed children and fruit-pickers and may affect some recreational activities." 3. "very sharp spines, borne in dense chaffy clusters in axils of most leaves" 4. "spines are a problem for dogs and stock but are particularly troublesome to humans as they penetrate skin"</p>
4.02		No evidence
4.03		No evidence
4.04	<p>1. Agriculture Victoria. <a href="http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed">http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed</a> (Accessed: 30 November 2016)</p> <p>2. Victoria Department of Economic Development, Jobs, Transport, &amp; Resources. <a href="http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed">http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed</a> (Accessed: 1 December 2016)</p>	<p>1. "The seed heads of khaki weed cause damage to the feet and mouths of animals and causes a skin ailment in cattle. The weed is also believed to be poisonous to animals; they however rarely eat it." 2. "Not really eaten, although at times young plants are moderately palatable to sheep and are consumed."</p>
4.05	<p>1. Queensland Government. <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm</a> (Accessed: 30 November 2016)</p> <p>2. Agriculture Victoria. <a href="http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed">http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed</a> (Accessed: 30 November 2016)</p> <p>3. Victoria Department of Economic Development, Jobs, Transport, &amp; Resources. <a href="http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/impact_khaki_weed">http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/impact_khaki_weed</a> (Accessed: 1 December 2016)</p>	<p>1. "Khaki weed (<i>Alternanthera pungens</i>) is also suspected of poisoning sheep and pigs, and causing digestive disturbances and skin ailments in cattle. Horses that graze on areas containing large amounts of this species have developed a form of staggers, and its burrs can contaminate lucerne hay and other stock feeds." 2. "The seed heads of khaki weed cause damage to the feet and mouths of animals and causes a skin ailment in cattle. The weed is also believed to be poisonous to animals; they however rarely eat it." 3. "The heads cause mechanical damage to the feet and mouths of stock."; "Khaki weed is believed to be poisonous to animals and to cause a skin ailment in cattle."</p>
4.06	<p>1. CABI Invasive Species Compendium. <a href="http://www.cabi.org/isc/datasheet/110614">http://www.cabi.org/isc/datasheet/110614</a> (Accessed: 1 December 2016)</p>	<p>1. Host of the cactus mealybug. 2. "In comparison to other mealybug species, the host range for <i>Hypogeococcus pungens</i> is fairly limited."; "Polygonaceae - <i>Alternanthera pungens</i> (khaki weed), <i>A. betzickiana</i> (joyweed)" listed as host plants</p>
4.07	<p>1. Agriculture Victoria. <a href="http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed">http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed</a> (Accessed: 30 November 2016)</p> <p>2. Mangrove Mountain. <a href="http://www.weeds.mangrovemountain.net/data/Alternanthera%20pungens%20-%20Khaki%20weed.pdf">http://www.weeds.mangrovemountain.net/data/Alternanthera%20pungens%20-%20Khaki%20weed.pdf</a> (Accessed: 1 December 2016)</p>	<p>1. "It is known to cause hay fever, asthma and dermatitis in some people." 2. "Can cause dermatitis, hay fever and asthma in humans."</p>
4.08	<p>1. Victoria Department of Economic Development, Jobs, Transport, &amp; Resources. <a href="http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/impact_khaki_weed">http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/impact_khaki_weed</a> (Accessed: 1 December 2016)</p>	<p>1. "Not likely to increase fuel load greatly. Small or negligible change to fire risk."</p>
4.09	<p>1. Dave's Garden. <a href="http://davesgarden.com/guides/pf/go/133369/#b">http://davesgarden.com/guides/pf/go/133369/#b</a> (Accessed: 30 November 2016)</p> <p>2. The National Gardening Association Plants Database. <a href="https://garden.org/plants/view/170754/Khakiweed-Alternanthera-pungens/">https://garden.org/plants/view/170754/Khakiweed-Alternanthera-pungens/</a> (Accessed: 1 December 2016)</p>	<p>1. Light shade to full sun. 2. Full sun to partial shade</p>



4.10	1. Agriculture Victoria. <a href="http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed">http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed</a> (Accessed: 1 December 2016) 2. Herbiguide. <a href="http://www.herbiguide.com.au/Descriptions/hg_Khaki_Weed.htm">http://www.herbiguide.com.au/Descriptions/hg_Khaki_Weed.htm</a> (Accessed: 1 December 2016)	1. "Khaki weed prefers tropical and subtropical regions. The plant grows mainly on light soils in areas with high temperatures. It is a troublesome weed in rural towns, occurring on nature strips, playing fields, caravan parks and saleyards. It occasionally invades native pastures on sandy soils but usually does not persist." 2. "Light soils or loams mainly."
4.11	1. Queensland Government. <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm</a> (Accessed: 15 November 2016) 2. Victoria Department of Economic Development, Jobs, Transport, & Resources. <a href="http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed">http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed</a> (Accessed: 30 November 2016)	1. Creeping 2. Creeping
4.12	1. Victoria Department of Economic Development, Jobs, Transport, & Resources. <a href="http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/impact_khaki_weed">http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/impact_khaki_weed</a> (Accessed: 1 December 2016)	1. "A prostrate creeping perennial. Would not restrict human access."
5.01	1. USDA Plants Database. <a href="http://plants.usda.gov/core/profile?symbol=Alpu3">http://plants.usda.gov/core/profile?symbol=Alpu3</a> (Accessed: 15 November 2016) 2. Victoria Department of Economic Development, Jobs, Transport, & Resources. <a href="http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/impact_khaki_weed">http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/impact_khaki_weed</a> (Accessed: 1 December 2016)	1. "Family: Amaranthaceae" 2. "Terrestrial species."
5.02	1. USDA Plants Database. <a href="http://plants.usda.gov/core/profile?symbol=Alpu3">http://plants.usda.gov/core/profile?symbol=Alpu3</a> (Accessed: 15 November 2016) 2. Queensland Government. <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm</a> (Accessed: 15 November 2016) 3. Victoria Agriculture. <a href="http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed">http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed</a> (Accessed: 30 November 2016)	1. Growth Habit: Forb/herb" 2. "A small, long-lived (i.e. perennial), creeping (i.e. prostrate), herbaceous plant with stem up to 60 cm long. This species often forms a dense mat of prickly vegetation over the ground surface." 3. "Herbaceous plant - Forb (flowering herbaceous plant - not a grass)"
5.03	1. USDA Plants Database. <a href="http://plants.usda.gov/core/profile?symbol=Alpu3">http://plants.usda.gov/core/profile?symbol=Alpu3</a> (Accessed: 15 November 2016) 2. Queensland Government. <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm</a> (Accessed: 15 November 2016) 3. Agriculture Victoria. <a href="http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed">http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed</a> (Accessed: 30 November 2016)	1. "Family: Amaranthaceae" 2. Herbaceous 3. "Herbaceous plant"
5.04	1. Agriculture Victoria. <a href="http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed">http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed</a> (Accessed: 30 November 2016) 2. Victoria Department of Economic Development, Jobs, Transport, & Resources. <a href="http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed">http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed</a> (Accessed: 30 November 2016) 3. The National Gardening Association Plants Database. <a href="https://garden.org/plants/view/170754/Khakiweed-Alternanthera-pungens/">https://garden.org/plants/view/170754/Khakiweed-Alternanthera-pungens/</a> (Accessed: 1 December 2016)	1. "propagates from an underground organ (geophyte)" 2. Geophyte 3. "Underground structures: Taproot"
6.01		No evidence
6.02	1. Queensland Government. <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm</a> (Accessed: 30 November 2016) 2. Victoria Department of Economic Development, Jobs, Transport, & Resources. <a href="http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed">http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed</a> (Accessed: 30 November 2016)	1. "This plant reproduces mainly by seed, though stem fragments may also take root after being dislodged from a plant." 2. "Seeds germinate after spring and summer rains."; "Reproducing by seed, roots and stems taking root at nodes."
6.03		No evidence

6.04		No evidence
6.05		No evidence
6.06	1. Queensland Government. <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm</a> (Accessed: 30 November 2016) 2. Agriculture Victoria. <a href="http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed">http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed</a> (Accessed: 30 November 2016) 3. Victoria Department of Economic Development, Jobs, Transport, & Resources. <a href="http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed">http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed</a> (Accessed: 30 November 2016)	1. "its creeping stems are somewhat hairy and produce roots at their joints"; "This plant reproduces mainly by seed, though stem fragments may also take root after being dislodged from a plant." 2. "Patches can quickly increase in size as new plants form at the stem nodes." 3. "Reproducing by seed, roots and stems taking root at nodes."
6.07		No evidence
7.01	1. Queensland Government. <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm</a> (Accessed: 30 November 2016) 2. Agriculture Victoria. <a href="http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed">http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed</a> (Accessed: 30 November 2016) 3. Victoria Department of Economic Development, Jobs, Transport, & Resources. <a href="http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed">http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed</a> (Accessed: 30 November 2016)	1. "The seeds are contained inside a 'burr' which readily becomes attached to animals, clothing and other objects (e.g. vehicle tyres)."; "Stem fragments can be spread by machinery, livestock or cultivation." 2. "Most dispersal occurs when khaki weed's prickly burrs attach to animals, equipment, clothing and tyres. The weed spreads very rapidly along roadsides when cars and vehicles travel on road verges." 3. "Prickly burrs attach to animals, equipment, clothing and tyres. Also by water and wind, wool, hay and impure grain from affected areas."
7.02	1. Agriculture Victoria. <a href="http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed">http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed</a> (Accessed: 30 November 2016)	1. "Cultivation carries these plants, as well as root fragments, to clean areas where they establish if moisture is adequate."
7.03	1. Queensland Government. <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm</a> (Accessed: 30 November 2016) 2. Victoria Department of Economic Development, Jobs, Transport, & Resources. <a href="http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed">http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed</a> (Accessed: 30 November 2016)	1. " They may also be dispersed by water movement and in contaminated agricultural produce (e.g. fodder and pasture seed)" 2. "Prickly burrs attach to animals, equipment, clothing and tyres. Also by water and wind, wool, hay and impure grain from affected areas."
7.04	1. Victoria Department of Economic Development, Jobs, Transport, & Resources. <a href="http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed">http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed</a> (Accessed: 30 November 2016)	1. "Prickly burrs attach to animals, equipment, clothing and tyres. Also by water and wind, wool, hay and impure grain from affected areas."
7.05	1. Queensland Government. <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/alternanthera_pungens.htm</a> (Accessed: 30 November 2016) 2. Victoria Department of Economic Development, Jobs, Transport, & Resources. <a href="http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed">http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed</a> (Accessed: 30 November 2016) 3. Useful Tropical Plants. <a href="http://tropical.theferns.info/viewtropical.php?id=Alternanthera+pungens">http://tropical.theferns.info/viewtropical.php?id=Alternanthera+pungens</a> (Accessed: 1 December 2016)	1. "They may also be dispersed by water movement" 2. "Prickly burrs attach to animals, equipment, clothing and tyres. Also by water and wind, wool, hay and impure grain from affected areas." 3. "Water will also spread the burrs short distances"
7.06	1. National Parks Service. Haleakala National Park Invasive Plant Field Guide. <a href="https://science.nature.nps.gov/im/units/pacn/assets/docs/Invasive_Species_Cards_and_Calendars_PBIN/NPS_CARDS_HALE_12_112012_final.pdf">https://science.nature.nps.gov/im/units/pacn/assets/docs/Invasive_Species_Cards_and_Calendars_PBIN/NPS_CARDS_HALE_12_112012_final.pdf</a> (Accessed: 1 December 2016)	1. "Khaki weed seeds are contained in the lower husk, which can catch on animal fur, bird feathers, hikers clothing, and car tires"

7.07	<p>1. Queensland Government. <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/alternant_hera_pungens.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/alternant_hera_pungens.htm</a> (Accessed: 30 November 2016) 2. Agriculture Victoria. <a href="http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed">http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed</a> (Accessed: 30 November 2016) 3. Victoria Department of Economic Development, Jobs, Transport, &amp; Resources. <a href="http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed">http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed</a> (Accessed: 30 November 2016)</p>	<p>1. "The seeds are contained inside a 'burr' which readily becomes attached to animals, clothing and other objects (e.g. vehicle tyres)." 2. "Most dispersal occurs when khaki weed's prickly burrs attach to animals, equipment, clothing and tyres. The weed spreads very rapidly along roadsides when cars and vehicles travel on road verges." 3. "Prickly burrs attach to animals, equipment, clothing and tyres. Also by water and wind, wool, hay and impure grain from affected areas."</p>
7.08	<p>1. Queensland Government. <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/alternant_hera_pungens.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/alternant_hera_pungens.htm</a> (Accessed: 30 November 2016)</p>	<p>1. "Stem fragments can be spread by machinery, livestock or cultivation."</p>
8.01	<p>1. Agriculture Victoria. <a href="http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed">http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed</a> (Accessed: 30 November 2016) 2. Victoria Department of Economic Development, Jobs, Transport, &amp; Resources. <a href="http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed">http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed</a> (Accessed: 30 November 2016)</p>	<p>1. "Khaki weed is a prolific seeder. The seeds remain viable for many years." 2. Prolific seeder and the seeds remain viable for years</p>
8.02	<p>1. Agriculture Victoria. <a href="http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed">http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/a-z-of-weeds/khaki-weed</a> (Accessed: 30 November 2016) 2. Victoria Department of Economic Development, Jobs, Transport, &amp; Resources. <a href="http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed">http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_khaki_weed</a> (Accessed: 30 November 2016) 3. Horizon Pest Control. <a href="http://www.horizonpestcontrol.net/b/khaki-weed-control-how-to-kill-khaki-weed-in-lawns/">http://www.horizonpestcontrol.net/b/khaki-weed-control-how-to-kill-khaki-weed-in-lawns/</a> (Accessed: 1 December 2016)</p>	<p>1. "Khaki weed is a prolific seeder. The seeds remain viable for many years." 2. Prolific seeder and the seeds remain viable for years 3. "While it's not specifically researched by us, there is evidence that suggests that Khaki seeds are only viable for up to two years."</p>
8.03	<p>1. Hephner, Andrew. Texas Tech University. <a href="https://ttu-ir.tdl.org/ttu-ir/bitstream/handle/2346/ETD-TTU-2011-08-1837/Hephner_Andrew_Thesis.pdf?sequence=4">https://ttu-ir.tdl.org/ttu-ir/bitstream/handle/2346/ETD-TTU-2011-08-1837/Hephner_Andrew_Thesis.pdf?sequence=4</a> (Accessed: 30 November 2016) 2. Northern Territory Government. <a href="https://nt.gov.au/environment/weeds/list-of-declared-weeds-in-the-nt/khaki-weed">https://nt.gov.au/environment/weeds/list-of-declared-weeds-in-the-nt/khaki-weed</a> (Accessed: 30 November 2016)</p>	<p>1. "Limited chemical control options exist for the reduction of khakiweed infestations. In fact, trifloxysulfuron is the only herbicide labeled for the postemergence control of khakiweed in turf."; "Excellent control (95 to 97%) was exhibited by sequential metsulfuron applications 12 WAIT regardless of rate. Sequential applications of trifloxysulfuron (0.018 or 0.028 kg ai ha<sup>-1</sup>) and single applications of metsulfuron at 0.042 kg ai ha<sup>-1</sup> exhibited moderate khakiweed control (75 to 80%) 12 WAIT. All other treatments exhibited ≤ 57% khakiweed control 12 WAIT." 2. "The best time to treat khaki weed is from December to March. Below is a list of treatment methods that can be used: 2, 4-D amine 625 g/L, Glyphosate 360 g/L, MCPA 340 g/L + Dicamba 80 g/L"</p>
8.04	<p>1. Queensland Government. <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/alternant_hera_pungens.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/alternant_hera_pungens.htm</a> (Accessed: 30 November 2016) 2. Texas A&amp;M AgriLife Extension. <a href="http://wichita.agrilife.org/files/2013/08/Khaki-weed.pdf">http://wichita.agrilife.org/files/2013/08/Khaki-weed.pdf</a> (Accessed: 30 November 2016)</p>	<p>1. "Stem fragments can be spread by machinery, livestock or cultivation." 2. "Khaki weed can reproduce from seed and by lateral stems, which can root at the nodes. Seeds germinate after spring or summer rain, develop a deep taproot and stems form during summer. Roots form at the nodes on the stems and produce new plants that thicken like ground cover. Khaki weed has a deep tap root which makes it very drought resistant, which helps it to establish even during dry periods. The taproot can also make the weed a perennial in warmer climates."</p>
8.05	<p>1. CABI Invasive Species Compendium. <a href="http://www.cabi.org/isc/datasheet/110614">http://www.cabi.org/isc/datasheet/110614</a> (Accessed: 1 December 2016)</p>	<p>1. Host of the cactus mealybug. 2. "In comparison to other mealybug species, the host range for Hypogeococcus pungens is fairly limited."; "Polygonaceae - Alternanthera pungens (khaki weed), A. bettzickiana (joyweed)" listed as host plants</p>