

Taxon: <i>Psoralea pinnata</i> L.	Family: Fabaceae
Common Name(s): African scurfpea blue broom blue pea dally pine	Synonym(s):

Assessor: Chuck Chimera	Status: Assessor Approved	End Date: 13 Mar 2017
WRA Score: 9.0	Designation: H(HPWRA)	Rating: High Risk

Keywords: Ornamental Tree, Environmental Weed, Dense Stands, N-Fixing, Water-Dispersed

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
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)	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	n
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	n
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
302	Garden/amenity/disturbance weed		
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)	y
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic	y=1, n=0	n
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals		
405	Toxic to animals	y=1, n=0	n
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
408	Creates a fire hazard in natural ecosystems		

Qsn #	Question	Answer Option	Answer
409	Is a shade tolerant plant at some stage of its life cycle		
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
412	Forms dense thickets	y=1, n=0	y
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	y
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	y
604	Self-compatible or apomictic		
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	2
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		
704	Propagules adapted to wind dispersal	y=1, n=-1	n
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	n
708	Propagules survive passage through the gut	y=1, n=-1	n
801	Prolific seed production (>1000/m2)	y=1, n=-1	y
802	Evidence that a persistent propagule bank is formed (>1 yr)	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
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

Supporting Data:

Qsn #	Question	Answer
101	Is the species highly domesticated?	n
	Source(s)	Notes
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	No evidence of domestication reported
102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. 2017. Personal Communication	NA
103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. 2017. 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"	Intermediate
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 12 Mar 2017]	"Native: Africa Southern Africa: South Africa - Western Cape" [Overall, the Western Cape climate is typically Mediterranean, with warm, dry summers and mild, moist winters and low summer rainfall prevail. Near the coast, summer's temperature rises from a pleasant low of 15° C to a heart warming 27° C. Inland temperatures are some 3-5° C higher.]
202	Quality of climate match data	High
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 12 Mar 2017]	

Qsn #	Question	Answer
203	Broad climate suitability (environmental versatility)	n
	Source(s)	Notes
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	"Ecology and habitat: In its native range <i>Psoralea pinnata</i> occurs in mountain fynbos, forest margins, and riverbeds at altitudes between 230 and 1060 m and favours damp sandy or peaty locations."
	Dave's Garden. 2017. Blouker, Fountain Bush. <i>Psoralea pinnata</i> . http://davesgarden.com/guides/pf/go/102853/ . [Accessed 12 Mar 2017]	"Hardiness: USDA Zone 8a: to -12.2 °C (10 °F) USDA Zone 8b: to -9.4 °C (15 °F) USDA Zone 9a: to -6.6 °C (20 °F) USDA Zone 9b: to -3.8 °C (25 °F) USDA Zone 10a: to -1.1 °C (30 °F) USDA Zone 10b: to 1.7 °C (35 °F)"

204	Native or naturalized in regions with tropical or subtropical climates	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 12 Mar 2017]	"Native: Africa Southern Africa: South Africa - Western Cape Naturalized: Australasia Australia: Australia - Tasmania, - New South Wales, - South Australia, - Victoria, - Western Australia New Zealand: New Zealand"

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	Queensland Government. (2017). Weeds of Australia. <i>Psoralea pinnata</i> . http://keyserver.lucidcentral.org . [Accessed 12 Mar 2017]	"African scurf-pea (<i>Psoralea pinnata</i>) has been widely cultivated as a garden ornamental, particularly in the temperate regions of Australia."
	Global Invasive Species Database (GISD). 2015. Species profile <i>Psoralea pinnata</i> . http://www.iucngisd.org/gisd/species.php?sc=1671 . [Accessed 12 Mar 2017]	" <i>Psoralea pinnata</i> is occasionally sold as an ornamental plant."
	Dave's Garden. 2017. Blouker, Fountain Bush. <i>Psoralea pinnata</i> . http://davesgarden.com/guides/pf/go/102853/ . [Accessed 12 Mar 2017]	"This plant has been said to grow in the following regions: Daly City, California Lakewood, California Richmond, California San Leandro, California Vista, California"

301	Naturalized beyond native range	y
	Source(s)	Notes

Qsn #	Question	Answer
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 12 Mar 2017]	"Naturalized: Australasia Australia: Australia - Tasmania, - New South Wales, - South Australia, - Victoria, - Western Australia New Zealand: New Zealand"
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	" <i>Psoralea pinnata</i> is the only naturalised <i>Psoralea</i> in South Australia, known only from a 1979 collection from Dismal Swamp, near Mt Gambier, in the far south-east of South Australia." ... " <i>Psoralea pinnata</i> is the only naturalised species of <i>Psoralea</i> in New Zealand and is mostly restricted to the North Island (Webb 1980; see map in Breitwieser et al. 2010–2015). Early records of naturalisation of <i>P. pinnata</i> are (Kirk 1870), Cheeseman (1883, 1913, 1925), Randall Page (1922) and Allan (1937). The pattern of early naturalisation followed a similar pattern to that in Australia. Thompson (1925) noted that in New Zealand this species was reported by Kirk to already occur in the Takapuna District, Auckland, and that ‘as it seeds profusely, small specimens are not uncommon in the neighbourhoods of gardens, deserted homesteads, etc. where it can scarcely be expected to become fully naturalised’. Later, however, Cheeseman (1912) had recorded it, on the authority of O. Oakley, as occurring wild at Waipu and threatening to become a nuisance. Further study is needed to track its path of naturalisation in New Zealand."
	Queensland Government. (2017). Weeds of Australia. <i>Psoralea pinnata</i> . http://keyserver.lucidcentral.org . [Accessed 12 Mar 2017]	"Widely naturalised in the coastal and sub-coastal districts of southern Australia (i.e. in eastern New South Wales, Victoria, Tasmania, south-eastern South Australia and south-western Western Australia). Also present in some inland parts of northern New South Wales. Naturalised overseas in New Zealand."

302	Garden/amenity/disturbance weed	
	Source(s)	Notes
	Queensland Government. (2017). Weeds of Australia. <i>Psoralea pinnata</i> . http://keyserver.lucidcentral.org . [Accessed 12 Mar 2017]	"A weed of riparian vegetation, swamps, coastal environs, heathlands, grasslands, shrublands, open woodlands, rocky outcrops, roadsides, disturbed sites and waste areas in the temperate regions of Australia" [Environmental weed]

303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence [Environmental weed]

304	Environmental weed	y
	Source(s)	Notes
	Queensland Government. (2017). Weeds of Australia. <i>Psoralea pinnata</i> . http://keyserver.lucidcentral.org . [Accessed 12 Mar 2017]	"African scurf-pea (<i>Psoralea pinnata</i>) is regarded as an environmental weed in Victoria, Tasmania, New South Wales and Western Australia."

Qsn #	Question	Answer
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	"Hussey et al. (1997) note that <i>P. pinnata</i> has become the dominant vegetation in swamps, creeks and roadsides in the Albany coastal agricultural region in Western Australia. Gilfillan and Barrett (2004) list the species as being a threatening competitor to <i>Ornduffia calthifolia</i> (F.Muell.) Tippet & Les, a rare species in Western Australia. Carr et al. (1992) consider it as posing a very serious threat to dry coastal vegetation, heathland and heathy woodland, lowland grassland and grassy woodland, and dry sclerophyll forest and woodland vegetation in Victoria. Muyt (2001) noted that it is highly invasive in Australia in heathlands."
	Global Invasive Species Database (GISD). 2015. Species profile <i>Psoralea pinnata</i> . http://www.iucngisd.org/gisd/species.php?sc=1671 . [Accessed 12 Mar 2017]	"It is reported to be highly invasive in heathland in Australia (Muyt 2001). In the far north of New Zealand <i>P. pinnata</i> is found on volcanic soils and is most common close to roads and tracks (Enright 1989)." ... "In Western Australia <i>P. pinnata</i> is one of several weeds that invades the habitat of the endangered mountain villarsia (<i>Villarsia calthifolia</i>) and is listed as a threatening competitor to this rare species (Gilfillan & Barrett 2004). <i>P. pinnata</i> is also one of several weeds (gorse (<i>Ulex europaeus</i> ; <i>Acacia longifolia</i> var <i>sophorae</i> ; bitou bush (<i>Chrysanthemoides monilifera</i>) that threatens the heath and swamp habitat of the emu wrens in south-west Victoria (Maguire & Mulder, 2004). Additionally these weeds need to be managed and cause the use of chemicals and other mechanical tools in this habitat."

305	Congeneric weed	y
	Source(s)	Notes
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	" <i>Psoralea arborea</i> ...It occurs along roadsides and escapes into bushland, and at sites such as Burnie it can form very dense and large populations where it can be dominant such as at Eaglehawk Neck, neglected and disturbed weedy areas, and quarries. Groves et al. (2005) record it as one of the ten most serious invasive garden plants available for sale in Tasmania (referred to as <i>P. pinnata</i> in their report)."
	Randall, R.P. (2017). <i>A Global Compendium of Weeds</i> . 3rd Edition. Perth, Western Australia. R.P. Randall	<i>Psoralea Americana</i> , <i>Psoralea aphylla</i> , <i>Psoralea arborea</i> , <i>Psoralea bituminosa</i> , <i>Psoralea cinerea</i> , <i>Psoralea corylifolia</i> , <i>Psoralea glandulosa</i> , <i>Psoralea graveolens</i> , <i>Psoralea lanceolata</i> , <i>Psoralea patens</i> , <i>Psoralea plicata</i> , <i>Psoralea rhombifolia</i> & <i>Psoralea tenuiflora</i> listed as naturalized and/or weeds

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

Qsn #	Question	Answer
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	[No evidence] "Much-branched shrub to small tree up to 5 m tall. Stems erect, 1(2), yellowish tan with storied white lenticels when young, becoming grey with age. Branches and twigs angular, sparsely hairy when immature. Stipules fused for most of their length, subulate, with incurled margins, hairy, overlapping like short stacked planks, becoming woody with age. Leaves 7–9-foliolate, imparipinnate, 25 mm long, 45–50 mm wide, villosa-pubescent, terminal leaflet shortest, basal pair longest, petiolate. Leaflets linear or linear-lanceolate, 20–45 mm long, 0.8–2.0 mm wide, acute to acuminate, dark green, glandular. Petiole 4–7 mm long, rachis 10–15 mm long. Inflorescences hidden within leaves, borne on short shootlets which are spread along the length of seasonal shoots, pseudo-spicate or pseudo-capitate, axillary, weakly scented or odourless."

402	Allelopathic	n
	Source(s)	Notes
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	"As it is an excellent nitrogen fixer it can change the soil fertility and thereby affect the persistence of indigenous species over the long term (Muyt 2001)." [Changes soil fertility, but no evidence of allelopathy]

403	Parasitic	n
	Source(s)	Notes
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	"Much-branched shrub to small tree up to 5 m tall." [Fabaceae. No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	Dave's Garden. 2017. Blouker, Fountain Bush. <i>Psoralea pinnata</i> . http://davesgarden.com/guides/pf/go/102853/ . [Accessed 12 Mar 2017]	[Possibly unpalatable] "Fast growing, beautiful when in flower. lovely fragrance, deer won't touch it. "

405	Toxic to animals	n
	Source(s)	Notes
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence

Qsn #	Question	Answer
406	Host for recognized pests and pathogens	
	Source(s)	Notes
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	No evidence
	WRA Specialist. 2017. Personal Communication	Unknown

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence

408	Creates a fire hazard in natural ecosystems	
	Source(s)	Notes
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	[Possibly promotes fire. Adapted to fire prone ecosystems] "Germination is stimulated by fire and, in the long run, dependent on it for regeneration. After fire, the plants produce masses of rapidly growing seedlings with copious production of root nodules associated predominantly with Mesorhizobium (Lemaire et al. 2014)."
	Global Invasive Species Database (GISD). 2015. Species profile <i>Psoralea pinnata</i> . http://www.iucngisd.org/gisd/species.php?sc=1671 . [Accessed 12 Mar 2017]	[Thickets might increase fuel load] " <i>Psoralea pinnata</i> is fast growing and can grow up to 1.5m in a year. It forms dense thickets that could shade out and impede the growth of lower stratal species(Muyt 2001)."

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	Notes
	Global Invasive Species Database (GISD). 2015. Species profile <i>Psoralea pinnata</i> . http://www.iucngisd.org/gisd/species.php?sc=1671 . [Accessed 12 Mar 2017]	" <i>P. pinnata</i> is tolerant of partial shade and invades forest."
	Dave's Garden. 2017. Blouker, Fountain Bush. <i>Psoralea pinnata</i> . http://davesgarden.com/guides/pf/go/102853/ . [Accessed 12 Mar 2017]	"Sun Exposure: Full Sun Sun to Partial Shade"

Qsn #	Question	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Global Invasive Species Database (GISD). 2015. Species profile <i>Psoralea pinnata</i> . http://www.iucngisd.org/gisd/species.php?sc=1671 . [Accessed 12 Mar 2017]	"it is found growing amongst low trees, low (sclerophyll) shrubland; in rocky or stony soil, gravelly soil, sand, loam, clay, wet soil"
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	"It occurs on sand, loam, clay and rocky soils (Carr et al. 1992; Hussey et al. 1997; Muyt 2001; AVH 2012)."

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	"Much-branched shrub to small tree up to 5 m tall."

412	Forms dense thickets	y
	Source(s)	Notes
	Global Invasive Species Database (GISD). 2015. Species profile <i>Psoralea pinnata</i> . http://www.iucngisd.org/gisd/species.php?sc=1671 . [Accessed 12 Mar 2017]	" <i>Psoralea pinnata</i> is fast growing and can grow up to 1.5m in a year. It forms dense thickets that could shade out and impede the growth of lower stratal species(Muyt 2001)."

501	Aquatic	n
	Source(s)	Notes
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	[Terrestrial] "In its native range <i>Psoralea pinnata</i> occurs in mountain fynbos, forest margins, and riverbeds at altitudes between 230 and 1060 m and favours damp sandy or peaty locations."

502	Grass	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 12 Mar 2017]	Family: Fabaceae (alt.Leguminosae) Subfamily: Faboideae Tribe: Psoraleeae

Qsn #	Question	Answer
503	Nitrogen fixing woody plant	y
	Source(s)	Notes
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	"As it is an excellent nitrogen fixer it can change the soil fertility and thereby affect the persistence of indigenous species over the long term (Muyt 2001)."
	Global Invasive Species Database (GISD). 2015. Species profile <i>Psoralea pinnata</i> . http://www.iucngisd.org/gisd/species.php?sc=1671 . [Accessed 12 Mar 2017]	" <i>P. pinnata</i> bears nodules that are associated with nitrogen-fixing bacteria. The species was examined for mycorrhizal associates by Hawley and Dames (2004): hyphae, vesicles and spores were found to be present in roots."
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	"Much-branched shrub to small tree up to 5 m tall."
601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Carolus, B. 2002. <i>Pachypodium namaquanum</i> . PlantZAfrica. SANBI. http://pza.sanbi.org/psoralea-pinnata . [Accessed 12 Mar 2017]	" <i>Psoralea pinnata</i> is a fairly widespread species growing from the Clanwilliam District south towards the Cape Peninsula and then eastwards and northwards through George and Knysna to the Eastern Cape, KwaZulu-Natal, Swaziland and Mphumalanga."
602	Produces viable seed	y
	Source(s)	Notes
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	"As in <i>P. arborea</i> , this species produces copious seeds."
	Carolus, B. 2002. <i>Pachypodium namaquanum</i> . PlantZAfrica. SANBI. http://pza.sanbi.org/psoralea-pinnata . [Accessed 9 Mar 2017]	"As with most Fabaceae, growing <i>Psoralea pinnata</i> is quite difficult from cuttings. It is best grown from seed. A handful of soil taken from below the parent plant and added to the seed tray is generally helpful when sowing Fabaceae seeds. This helps to ensure that the symbiotic mycorrhiza which grow on the roots and encourage nutrient uptake are present."
603	Hybridizes naturally	y
	Source(s)	Notes
	Bello, A. (2015). Taxonomy and evolutionary studies on the genus <i>Psoralea</i> L. (Psoraleeae, Fabaceae). PhD Dissertation, University of Cape Town	"Hybridization may account for some of the patterns in <i>Psoralea</i> as some of the taxa have been observed by me forming hybrids in the field e.g. <i>P. pinnata</i> × <i>P. aculeata</i> , <i>P. sordida</i> × <i>P. forbesii</i> , and <i>P. intonsa</i> × <i>P. oreopola</i> ."
604	Self-compatible or apomictic	

Qsn #	Question	Answer
	Source(s)	Notes
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	"Flowers 14–18 mm long, pale mauve to blue, axillary, sessile or subsessile, 1–6 per axil, subtended by a pinnate leaf; bracts a fused trifold cupulate structure situated at apex of a 2–5 mm long pedicel, overlapping the base of the calyx, carinal tooth longer than other two teeth, sparsely white hairy, margins ciliate with few black hairs. Calyx 8–9 mm long, glabrescent, mainly white-haired but also with black hairs on margins, or a mixture of black and white hairs, teeth dark green, shorter than yellowish green tube; ovate-acute to triangular. Standard petal 1–16(–18) mm long, 11 mm wide, obovate, white suffused with pale mauve in the central area and with a single purple 3–4 mm long flash situated between and above the free swollen callosities at the top rim of the claw; veins hyaline. Wing petals 13–14 mm long, 4 mm wide, longer than keel petals; white to pale mauve, blade folded and puckered along the mid-line; sculpturing present. Keel 12 mm long, 3.5–4.0 mm wide; white to pale mauve, shorter than wings. Androecium 6–7 mm long. Pistil 12 mm long; ovary 2 mm long, covered in club-shaped glands; style filamentous but thickened at point of flexure, stigma penicillate."
	East, E. M. 1940. The distribution of self-sterility in the flowering plants. <i>Proceedings of the American Philosophical Society</i> 82: 449-518	[<i>Psoralea</i> included among self-fertile genera] "The record of genera in which self-fertile species were found is as follows. The order corresponds with Engler and Prantl, the numbers being those of the species investigated when more than one." ... "Papilionatae. Ateleia, Camoensia, Sophora, Cladrastis, Crotalaria- 2, Laburnum-2, Indigofera, <i>Psoralea</i> , Gliricidia, Robinia- 2, Caragana-4, Desmodium, Lespedeza, Lonchocarpus- 2, Abrus, Clitoria, Erythrina-7, Canavalia-3, Rhynchosia, Dolichos."

605	Requires specialist pollinators	n
	Source(s)	Notes
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	"Flowers are visited predominantly by large Xylocopid (see Stirton 2007a, 2007b, 2007c, 2007d) and Megachilid bees, which divide large plant colonies into scattered communal feeding trees interrupted by localised adjacent territories of two to five trees, which the bees defend vigorously. Butterflies have been recorded feeding opportunistically on flowers of this species (<i>Vanessa cardui</i> (Linnaeus, 1758) – Painted Lady (see Voget 2011)),"
	Carolus, B. 2002. <i>Pachypodium namaquanum</i> . PlantZAfrica. SANBI. http://pza.sanbi.org/psoralea-pinnata . [Accessed 12 Mar 2017]	"The pea-flowers are borne at the ends of the branches or in the axils of the upper leaves. Although the flowers are seldom very showy, they are delicate and charming on the slender branches. White-eyes are often seen probing after insects attracted to the flowers."

Qsn #	Question	Answer
606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	Global Invasive Species Database (GISD). 2015. Species profile <i>Psoralea pinnata</i> . http://www.iucngisd.org/gisd/species.php?sc=1671 . [Accessed 12 Mar 2017]	" <i>Psoralea pinnata</i> reproduces by seed and can produce thousands of propagules (seeds) annually (Muyt 2001)." ... " <i>P. pinnata</i> is capable of vegetative regeneration and resprouts from its base (FloraBase 2010)." [Does not spread vegetatively, but able to regenerate. See 8.04]

607	Minimum generative time (years)	2
	Source(s)	Notes
	Global Invasive Species Database (GISD). 2015. Species profile <i>Psoralea pinnata</i> . http://www.iucngisd.org/gisd/species.php?sc=1671 . [Accessed 12 Mar 2017]	"In terms of reproductive period the plant can live for 15 years and is able to start flowering in its second year which would give it a potential reproductive period of more than 10 years (Blood 2001, Elioovson 1960, Muyt 2001, in Department of Primary Industries 2008b)."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y
	Source(s)	Notes
	Global Invasive Species Database (GISD). 2015. Species profile <i>Psoralea pinnata</i> . http://www.iucngisd.org/gisd/species.php?sc=1671 . [Accessed]	"Human aided dispersal of <i>Psoralea pinnata</i> seeds may occur through movement of machinery and contaminated soil (FloraBase 2010). Dispersal over more than 1 km through contaminated machinery has been observed (Mitchard pers comm. 2007, in Department). <i>Psoralea pinnata</i> is occasionally sold as an ornamental plant."
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	"In Australia, <i>P. pinnata</i> reproduces mainly by seed (shed copiously locally then secondarily dispersed by water) in contaminated soil and in dumped garden waste." ... "In Australia, <i>P. pinnata</i> occupies various vegetation formations along streams, in swamps, heathland, dry coastal vegetation, dry sclerophyll forest and woodland, grassy woodlands, rocky outcrops, disturbed tracks and roadsides, rubbish tips, waste places and quarries."

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Global Invasive Species Database (GISD). 2015. Species profile <i>Psoralea pinnata</i> . http://www.iucngisd.org/gisd/species.php?sc=1671 . [Accessed 12 Mar 2017]	" <i>Psoralea pinnata</i> is occasionally sold as an ornamental plant."

703	Propagules likely to disperse as a produce contaminant	
	Source(s)	Notes

Qsn #	Question	Answer
	Global Invasive Species Database (GISD). 2015. Species profile <i>Psoralea pinnata</i> . http://www.iucngisd.org/gisd/species.php?sc=1671 . [Accessed 12 Mar 2017]	"Human aided dispersal of <i>Psoralea pinnata</i> seeds may occur through movement of machinery and contaminated soil (FloraBase 2010). Dispersal over more than 1 km through contaminated machinery has been observed (Mitchard pers comm. 2007, in Department). <i>Psoralea pinnata</i> is occasionally sold as an ornamental plant." [Possibly if seeds drop into potting soil or potted plants cultivated in vicinity]

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	"Fruits 4–5 mm long, 2.5–3.0 mm wide. Seeds 1.2–4 mm long, dark brown to black." ... "In Australia, <i>P. pinnata</i> reproduces mainly by seed (shed copiously locally then secondarily dispersed by water) in contaminated soil and in dumped garden waste."

705	Propagules water dispersed	y
	Source(s)	Notes
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	"In Australia, <i>P. pinnata</i> reproduces mainly by seed (shed copiously locally then secondarily dispersed by water) in contaminated soil and in dumped garden waste."

706	Propagules bird dispersed	n
	Source(s)	Notes
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	"Fruits 4–5 mm long, 2.5–3.0 mm wide. Seeds 1.2–4 mm long, dark brown to black." ... "In Australia, <i>P. pinnata</i> reproduces mainly by seed (shed copiously locally then secondarily dispersed by water) in contaminated soil and in dumped garden waste." [No evidence]

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	"Fruits 4–5 mm long, 2.5–3.0 mm wide. Seeds 1.2–4 mm long, dark brown to black." ... "In Australia, <i>P. pinnata</i> reproduces mainly by seed (shed copiously locally then secondarily dispersed by water) in contaminated soil and in dumped garden waste." [No evidence]

708	Propagules survive passage through the gut	n
	Source(s)	Notes
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	"Fruits 4–5 mm long, 2.5–3.0 mm wide. Seeds 1.2–4 mm long, dark brown to black." ... "In Australia, <i>P. pinnata</i> reproduces mainly by seed (shed copiously locally then secondarily dispersed by water) in contaminated soil and in dumped garden waste." [No evidence of internal dispersal]

801	Prolific seed production (>1000/m2)	y
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Qsn #	Question	Answer
	Source(s)	Notes
	Stirton, C. H., Stajsic, V., & Bello, A. (2015). Naturalised species of <i>Psoralea</i> (Fabaceae: Psoraleeae) in Australia. <i>Muelleria</i> , 33, 97-107	"In Tasmania, <i>P. pinnata</i> is currently only known from disused tips and disused mine sites. As in <i>P. arborea</i> , this species produces copious seeds."
	Global Invasive Species Database (GISD). 2015. Species profile <i>Psoralea pinnata</i> . http://www.iucngisd.org/gisd/species.php?sc=1671 . [Accessed 12 Mar 2017]	" <i>Psoralea pinnata</i> reproduces by seed and can produce thousands of propagules (seeds) annually (Muyt 2001)."

802	Evidence that a persistent propagule bank is formed (>1 yr)	y
	Source(s)	Notes
	Global Invasive Species Database (GISD). 2015. Species profile <i>Psoralea pinnata</i> . http://www.iucngisd.org/gisd/species.php?sc=1671 . [Accessed 12 Mar 2017]	"Seeds remain persistent in soil for at least 8 years (Muyt 2001)."

803	Well controlled by herbicides	y
	Source(s)	Notes
	Global Invasive Species Database (GISD). 2015. Species profile <i>Psoralea pinnata</i> . http://www.iucngisd.org/gisd/species.php?sc=1671 . [Accessed 12 Mar 2017]	"Management notes in FloraBase (2010) suggest hand-pulling or digging out young plants and seedlings. For mature shrubs they suggest cutting and painting with 50% glyphosate. Since <i>P. pinnata</i> is capable of resprouting, a 1% glyphosate spray of resprouting material is suggested. <i>P. pinnata</i> seeds are known to persist in the soil for upto 8 years, therefore treated sites need to be managed for at least 8 years."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	Source(s)	Notes
	Global Invasive Species Database (GISD). 2015. Species profile <i>Psoralea pinnata</i> . http://www.iucngisd.org/gisd/species.php?sc=1671 . [Accessed 12 Mar 2017]	"It is tolerant to frost (to temperatures of -4°C), fire (fire stimulates germination and mature plants can reprot),"

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. 2017. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits

- Naturalized in Australia and New Zealand
- Regarded as an environmental weed in Australia (threatens native plants)
- Other *Psoralea* species are invasive
- Tolerates many soil types
- Capable of forming dense stands)
- N-Fixing (alters soil chemistry)
- Reproduces by seeds
- Reaches maturity in 2 years
- Seeds dispersed by water, as a soil contaminant & intentionally by people
- Prolific seed production
- Seeds persist in the soil for 8 years
- Resprouts after cutting & fire

Low Risk Traits

- Native to Mediterranean climate (may limit ability to invade in tropical/subtropical environments)
- Unarmed (no spines, thorns or burrs)
- Ornamental
- Herbicides may provide effective control