

<b>Taxon:</b> <i>Pachypodium saundersii</i> N. E. Br.	<b>Family:</b> Apocynaceae
<b>Common Name(s):</b> kudu lily rathbonia star of the Lundi	<b>Synonym(s):</b> <i>P. lealii</i> subsp. <i>saundersii</i> (N. E. Br.) G.

<b>Assessor:</b> Chuck Chimera	<b>Status:</b> Assessor Approved	<b>End Date:</b> 25 Jan 2017
<b>WRA Score:</b> -1.0	<b>Designation:</b> L	<b>Rating:</b> <span style="background-color: yellow;">Low Risk</span>

**Keywords:** Tuberos, Shrub, Spiny, Toxic, Wind-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)	High
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	y
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	n
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)	n
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	n
401	Produces spines, thorns or burrs	y=1, n=0	y
402	Allelopathic		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals	y=1, n=-1	y
405	Toxic to animals	y=1, n=0	y
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	y
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	n

Qsn #	Question	Answer Option	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	n
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	n
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
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		
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	>3
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	n
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
704	Propagules adapted to wind dispersal	y=1, n=-1	y
705	Propagules water dispersed	y=1, n=-1	n
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)		
708	Propagules survive passage through the gut	y=1, n=-1	n
801	Prolific seed production (>1000/m2)		
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	n
803	Well controlled by herbicides		
804	Tolerates, or benefits from, mutilation, cultivation, or fire		
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
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	No evidence of domestication

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"	High
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 24 Jan 2017]	"Native: Africa South Tropical Africa: Mozambique; Zimbabwe Southern Africa: South Africa - KwaZulu-Natal, - Transvaal; Swaziland"

202	Quality of climate match data	High
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 24 Jan 2017]	

203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"ECOLOGY. Savanna on granite, limestone, basalt, rhyolite, sandstone and sand. Alt. 70-1200 m." [Elevation range exceeds 1000 m. Demonstrates environmental versatility]
	Dave's Garden. 2017. Star of Lundi, Lundi Star - <i>Pachypodium saundersii</i> . <a href="http://davesgarden.com/guides/pf/go/53176/">http://davesgarden.com/guides/pf/go/53176/</a> . [Accessed 25 Jan 2017]	"Hardiness: USDA Zone 10a: to -1.1 °C (30 °F) USDA Zone 10b: to 1.7 °C (35 °F) USDA Zone 11: above 4.5 °C (40 °F)"

Qsn #	Question	Answer
204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 24 Jan 2017]	"Native: Africa South Tropical Africa: Mozambique; Zimbabwe Southern Africa: South Africa - KwaZulu-Natal, - Transvaal; Swaziland"

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	Dave's Garden. 2017. Star of Lundi, Lundi Star - <i>Pachypodium saundersii</i> . <a href="http://davesgarden.com/guides/pf/go/53176/">http://davesgarden.com/guides/pf/go/53176/</a> . [Accessed 25 Jan 2017]	"Regional This plant has been said to grow in the following regions: Maricopa, Arizona Mesa, Arizona Peoria, Arizona Phoenix, Arizona Tucson, Arizona Brea, California Carlsbad, California Hayward, California Reseda, California Spring Valley, California Thousand Oaks, California Tulare, California Delray Beach, Florida Miami, Florida Venice, Florida Nahunta, Georgia Kailua, Hawaii Wailuku, Hawaii Lake Charles, Louisiana Austin, Texas Floresville, Texas San Antonio, Texas (2 reports)"
	Stein, G. 2012. <i>Pachypodiums</i> - The caudiciform collectors plant- Introduction to the species and cultivational suggestions. <a href="http://davesgarden.com/guides/articles/view/539">http://davesgarden.com/guides/articles/view/539</a> . [Accessed 25 Jan 2017]	"This is a popular species because it is so easy to grow, but it is probably one of the least ornamental of the genus, having a less-than-impressive caudex often, and growing somewhat sloppily."

301	Naturalized beyond native range	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence
	Wagner, W.L., Herbst, D.R.& Lorence, D.H. 2017. Flora of the Hawaiian Islands. Smithsonian Institution, Washington, D.C. <a href="http://botany.si.edu/">http://botany.si.edu/</a> . [Accessed 25 Jan 2017]	No evidence to date

302	Garden/amenity/disturbance weed	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

Qsn #	Question	Answer
303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

304	Environmental weed	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

305	Congeneric weed	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

401	Produces spines, thorns or burrs	y
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"Shrub 0.5-1.5(-5) m with a large tuberous base, 20-100 cm in diameter, partly above the soil; bark grey or grey-green. Branches thick at the base; branchlets 5-8 mm in diameter, covered with long, paired straight, rarely curved spines, 10-45 mm long, 1-4 mm wide at the base, often in between a small third one, 3-13 mm long and 0.5-2 mm wide at the base, fused at their base and forming a subconical and laterally compressed excrescence, 3-7 x 1-4 x 1-5 mm, on which the leaf is inserted in a depression in the centre."

402	Allelopathic	
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	[Unknown. Grows with other vegetation] " <i>Pachypodium saundersii</i> grows on basalt, granitic rocks, limestone, sand and sandstone. This species occurs in a number of Savanna biomes in South Africa: Lebombo Arid Mountain Bushveld, Mixed Bushveld, Mixed Lowveld Bushveld, Mopane Bushveld, Natal Lowveld Bushveld, Sour Lowveld Bushveld, Soutpansberg Arid Mountain Bushveld, and Sweet Lowveld Bushveld. It is found in association with <i>Azelia quanzensis</i> , <i>Combretum apiculatum</i> , <i>Faurea</i> sp., <i>Huernia</i> sp., <i>Indigofera</i> sp., <i>Olinia</i> sp., <i>Plectranthus cylindraceus</i> , <i>Pterocelastrus</i> sp., <i>Sclerocarya cqffra</i> , and according to Correia & Marques 1196 also with <i>Colophospermum mopane</i> (Leguminosae), <i>Strychnos</i> sp. (Loganiaceae) and <i>Sansevieria</i> sp. (Dracaenaceae)."

403	Parasitic	n
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"Shrub 0.5-1.5(-5) m with a large tuberous base, 20-100 cm in diameter, partly above the soil; bark grey or grey-green." [Apocynaceae. No evidence]

404	Unpalatable to grazing animals	y
	<b>Source(s)</b>	<b>Notes</b>
	Van Jaarsveld, E. J. (2015). Succulents and Their Adaptation to Mega-Herbivores in the Gonarezhou National Park (Eastern Zimbabwe) and the First Records in Zimbabwe of the Succulent Twiner <i>Tinospora fragosa</i> and a Succulent Mistletoe, <i>Agelanthus crassifolius</i> . <i>Haseltonia</i> 21: 41–55	" <i>Pachypodium saundersii</i> , in the same family, has a large caudex and can be found on steep rocky outcrops near the Runde and Save rivers (Fig. 10). It has spines as well as toxic sap which provides some additional protection." ... "Defence - Chemical & mechanical resistance"
	WRA Specialist. 2017. Personal Communication	Unknown, but spines, and potential toxicity, might deter browsing

405	Toxic to animals	y
	<b>Source(s)</b>	<b>Notes</b>
	Dave's Garden. 2017. Star of Lundi, Lundi Star - <i>Pachypodium saundersii</i> . <a href="http://davesgarden.com/guides/pf/go/53176/">http://davesgarden.com/guides/pf/go/53176/</a> . [Accessed 25 Jan 2017]	"Danger: All parts of plant are poisonous if ingested"
	Bester, S. P. 2007. <i>Pachypodium</i> Lindl. PlantZAfrica. SANBI. <a href="https://www.plantzafrica.com/plantnop/pachypodium.htm">https://www.plantzafrica.com/plantnop/pachypodium.htm</a> . [Accessed 25 Jan 2017]	" <i>Pachypodium</i> falls in a group of the Apocynaceae notorious for poisonous properties and for yielding potent poisons that have been used most effectively in arrow poison since ancient times. The active principles in these poisons are usually glucosides with a digitalis-like action that stimulates the heart, and their effect is well known to hunters who often control and administer them with great skill."

406	Host for recognized pests and pathogens	
	<b>Source(s)</b>	<b>Notes</b>
	Highland Succulents. 2012. <i>Pachypodium</i> . The Complete Guide To Cultivation. <a href="http://www.highlandsucculents.com/culture/highland%20pachypodium%20culture%20guide.pdf">http://www.highlandsucculents.com/culture/highland%20pachypodium%20culture%20guide.pdf</a> . [Accessed 25 Jan 2017]	"Pests - Fortunately most insect pests are not attracted to <i>Pachypodiums</i> . Most collections will see the odd breakout of mealybug but difficult pests such as mites and whiteflies leave them alone. If the need arises for chemical controls, absolutely do not use petroleum based products. These are labeled "liquid" this or that such as malithion and are designated emulsifiable concentrate, "EC", or just "E". Systemics such as Cygon also fall in this group and are highly toxic to you and your plants. EC's will severely burn succulents so avoid them at all costs and use wettable powders and water based (aqua flow) products. It's up to you to do your homework on the insect you are trying to control and the right chemical to use for your plants."

407	Causes allergies or is otherwise toxic to humans	y
	<b>Source(s)</b>	<b>Notes</b>

Qsn #	Question	Answer
	Dave's Garden. 2017. Star of Lundi, Lundi Star - <i>Pachypodium saundersii</i> . <a href="http://davesgarden.com/guides/pf/go/53176/">http://davesgarden.com/guides/pf/go/53176/</a> . [Accessed 25 Jan 2017]	"Danger: All parts of plant are poisonous if ingested"
	Bester, S. P. 2007. <i>Pachypodium</i> Lindl. PlantZAfrica. SANBI. <a href="https://www.plantzafrica.com/plantnop/pachypodium.htm">https://www.plantzafrica.com/plantnop/pachypodium.htm</a> . [Accessed 25 Jan 2017]	" <i>Pachypodium</i> falls in a group of the Apocynaceae notorious for poisonous properties and for yielding potent poisons that have been used most effectively in arrow poison since ancient times. The active principles in these poisons are usually glucosides with a digitalis-like action that stimulates the heart, and their effect is well known to hunters who often control and administer them with great skill. "
	Stein, G. 2012. <i>Pachypodiums</i> - The caudiciform collectors plant- Introduction to the species and cultivational suggestions. <a href="http://davesgarden.com/guides/articles/view/539">http://davesgarden.com/guides/articles/view/539</a> . [Accessed 25 Jan 2017]	" <i>Pachypodiums</i> are members of the family Apocynaceae which also includes <i>Adeniums</i> , <i>Oleanders</i> , <i>Plumeria</i> and <i>Periwinkles</i> . <i>Pachypodium</i> means 'thick foot', referring to the large, swollen caudiciform stems all members of this genus have. They not only have succulent stems but most are heavily armed with thick, stiff spines on the caudex and branches. They are also protected by their toxic sap (true of all Apocynaceae, though <i>Pachypodiums</i> have clear sap, not the white latex seen running from <i>Plumeria</i> injuries)."

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"Shrub 0.5-1.5(-5) m with a large tuberous base" ... "ECOLOGY. Savanna on granite, limestone, basalt, rhyolite, sandstone and sand. Alt. 70-1200 m." [No evidence. Unlikely given succulent habit & habitat]

409	Is a shade tolerant plant at some stage of its life cycle	n
	Source(s)	Notes
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"In Hawaii, <i>pachypodiums</i> are grown only in hot, dry areas in full sun and are carefully and sparingly watered."
	Dave's Garden. 2017. Star of Lundi, Lundi Star - <i>Pachypodium saundersii</i> . <a href="http://davesgarden.com/guides/pf/go/53176/">http://davesgarden.com/guides/pf/go/53176/</a> . [Accessed 25 Jan 2017]	"Sun Exposure: Full Sun"

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	n
	Source(s)	Notes
	Llamas, K.A. 2003. Tropical Flowering Plants. Timber Press, Portland, OR	"Gritty, very porous soil. Full sun."
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	" <i>Pachypodium saundersii</i> grows on basalt, granitic rocks, limestone, sand and sandstone."
	Dave's Garden. 2017. Star of Lundi, Lundi Star - <i>Pachypodium saundersii</i> . <a href="http://davesgarden.com/guides/pf/go/53176/">http://davesgarden.com/guides/pf/go/53176/</a> . [Accessed 25 Jan 2017]	"Soil pH requirements: 6.1 to 6.5 (mildly acidic)"

Qsn #	Question	Answer
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"They are planted in well-drained substrates ..."

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"Shrub 0.5-1.5(-5) m with a large tuberous base, 20-100 cm in diameter, partly above the soil; bark grey or grey-green."

412	Forms dense thickets	n
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	[No evidence] " <i>Pachypodium saundersii</i> grows on basalt, granitic rocks, limestone, sand and sandstone. This species occurs in a number of Savanna biomes in South Africa: Lebombo Arid Mountain Bushveld, Mixed Bushveld, Mixed Lowveld Bushveld, Mopane Bushveld, Natal Lowveld Bushveld, Sour Lowveld Bushveld, Soutpansberg Arid Mountain Bushveld, and Sweet Lowveld Bushveld. It is found in association with <i>Azelia quanzensis</i> , <i>Combretum apiculatum</i> , <i>Faurea</i> sp., <i>Huernia</i> sp., <i>Indigofera</i> sp., <i>Olinia</i> sp., <i>Plectranthus cylindraceus</i> , <i>Pterocelastrus</i> sp., <i>Sclerocarya coccifera</i> , and according to Correia & Marques 1196 also with <i>Colophospermum mopane</i> (Leguminosae), <i>Strychnos</i> sp. (Loganiaceae) and <i>Sansevieria</i> sp. (Dracaenaceae). The rainfall is approximately between 300 and 800 mm per year. The temperature varies from about 5°C to well over 40°C (J.J. Lavranos, pers. comm.). <i>P. saundersii</i> occurs at altitudes of 100 to 1000 m."
	Schmidt, E., Lötter, M. & McClelland, W. 2002. Trees and shrubs of Mpumalanga and Kruger National Park. Jacana Media, Johannesburg, South Africa	[No evidence] "Succulent shrub to 1.5 m; among rocks in dry, low-lying bushveld or on wooded rocky ridges."

501	Aquatic	n
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	[Terrestrial] "Shrub 0.5-1.5(-5) m with a large tuberous base" ... "ECOLOGY. Savanna on granite, limestone, basalt, rhyolite, sandstone and sand. Alt. 70-1200 m."

502	Grass	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 24 Jan 2017]	Family: Apocynaceae Subfamily: Apocynoideae Tribe: Malouetieae

503	Nitrogen fixing woody plant	n
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 24 Jan 2017]	Family: Apocynaceae Subfamily: Apocynoideae Tribe: Malouetieae

<b>504</b>	<b>Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"Shrub 0.5-1.5(-5) m with a large tuberous base, 20-100 cm in diameter, partly above the soil; bark grey or grey-green."

<b>601</b>	<b>Evidence of substantial reproductive failure in native habitat</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Wiersema, J.H. & León, B. 1999. <i>World Economic Plants: A Standard Reference</i> . CRC Press, Boca Raton, FL	"CITES-II" [Appendix II lists species that are not necessarily now threatened with extinction but that may become so unless trade is closely controlled.]

<b>602</b>	<b>Produces viable seed</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Schmidt, E., Lötter, M. & McClelland, W. 2002. <i>Trees and shrubs of Mpumalanga and Kruger National Park</i> . Jacana Media, Johannesburg, South Africa	"An attractive garden plant which can be grown from seed."
	Dave's Garden. 2017. <i>Star of Lundi, Lundi Star - Pachypodium saundersii</i> . <a href="http://davesgarden.com/guides/pf/go/53176/">http://davesgarden.com/guides/pf/go/53176/</a> . [Accessed 25 Jan 2017]	"Propagation Methods: From herbaceous stem cuttings Allow cut surface to callous over before planting From seed; sow indoors before last frost"
	LLIFLE - Encyclopedia of living forms. 2017. <i>Pachypodium saundersii</i> . <a href="http://www.llifle.com/">http://www.llifle.com/</a> . [Accessed 25 Jan 2017]	"Seeds: Numerous 6-7(-9) mm long, ovate in outline, compressed, with a apical coma (tuft of whitish or pale golden silky hairs) at one end, up to 2-2.5 cm long."

<b>603</b>	<b>Hybridizes naturally</b>	
	<b>Source(s)</b>	<b>Notes</b>
	Eggl, U. 2002. <i>Illustrated handbook of succulent plants: Dicotyledons</i> . Springer-Verlag, Berlin - Heidelberg - New York	[Unknown] "Occasional wild hybrids have been reported, and garden hybrids have been created, but none so fare between Madagascan and African species."

Qsn #	Question	Answer
604	<b>Self-compatible or apomictic</b>	
	<b>Source(s)</b>	<b>Notes</b>
	Lipow, S. R., & Wyatt, R. (1999). Floral morphology and late-acting self-incompatibility in <i>Apocynum cannabinum</i> (Apocynaceae). <i>Plant Systematics and Evolution</i> , 219(1-2): 99-109	[Unknown for <i>P. saundersii</i> ] "... five species of <i>Pachypodium</i> (Anderson 1983) are self compatible."

605	<b>Requires specialist pollinators</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	LLIFLE - Encyclopedia of living forms. 2017. <i>Pachypodium saundersii</i> . <a href="http://www.llifle.com/">http://www.llifle.com/</a> . [Accessed 25 Jan 2017]	"It produces terminal clusters of large white flowers tinged with purple, they are long-tubed and adapted to pollination by moths."
	Living Stones Nursery & Plants for the Southwest. 2017. <i>Pachypodium saundersii</i> . <a href="http://www.lithops.net/pachypodium_saundersii_detail.htm">http://www.lithops.net/pachypodium_saundersii_detail.htm</a> . [Accessed 25 Jan 2017]	"The 1 1/2-2" diameter flowers are easily hand pollinated using the typical moth mimicking technique, but are often pollinated by our resident hawk or sphinx moths. This plant was pollinated in this way, and I think way more effective than if I had attempted it. "

606	<b>Reproduction by vegetative fragmentation</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Dave's Garden. 2017. Star of Lundi, <i>Lundi Star - Pachypodium saundersii</i> . <a href="http://davesgarden.com/guides/pf/go/53176/">http://davesgarden.com/guides/pf/go/53176/</a> . [Accessed 25 Jan 2017]	"Propagation Methods: From herbaceous stem cuttings Allow cut surface to callous over before planting From seed; sow indoors before last frost"
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"Shrub 0.5-1.5(-5) m with a large tuberous base, 20-100 cm in diameter, partly above the soil; bark grey or grey-green. Branches thick at the base; branchlets 5-8 mm in diameter, covered with long, paired straight, rarely curved spines, 10-45 mm long, 1-4 mm wide at the base," [No evidence that plant spreads vegetatively]

607	<b>Minimum generative time (years)</b>	>3
	<b>Source(s)</b>	<b>Notes</b>
	LLIFLE - Encyclopedia of living forms. 2017. <i>Pachypodium saundersii</i> . <a href="http://www.llifle.com/">http://www.llifle.com/</a> . [Accessed 25 Jan 2017]	"Blooming season: It flowers in autumn at the end of the summer growing season. It generally bloom at a younger age than other <i>Pachypodiums</i> , typically around 4-5 years old."
	Stein, G. 2012. <i>Pachypodiums</i> - The caudiciform collectors plant- Introduction to the species and cultivational suggestions. <a href="http://davesgarden.com/guides/articles/view/539">http://davesgarden.com/guides/articles/view/539</a> . [Accessed 25 Jan 2017]	" <i>Pachypodium saundersii</i> ... Flowers are white in the late summer to fall and plants as young as 4 years can flower."

701	<b>Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)</b>	n
	<b>Source(s)</b>	<b>Notes</b>

Qsn #	Question	Answer
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"The seeds of <i>Pachypodium</i> spp. are provided with awns suggesting that dispersal is by wind. However, according to Keraudren (1963) wind dispersal may not be very effective because the awns of the seeds separate easily or even as soon as the fruit follicles open, and the seeds will fall on the ground near the mother plant." [No evidence, although possible that tufted seeds could adhere to clothing or vehicles]

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Rau, E. 2016. President, Sustainable Bioresources, LLC. Personal Communication. 29 December	" <i>P. saundersii</i> (very hardy here outdoors in containers, cinder soil with dolomite)"
	Stein, G. 2012. <i>Pachypodiums</i> - The caudiciform collectors plant- Introduction to the species and cultivational suggestions. <a href="http://davesgarden.com/guides/articles/view/539">http://davesgarden.com/guides/articles/view/539</a> . [Accessed 25 Jan 2017]	"This is a popular species because it is so easy to grow, but it is probably one of the least ornamental of the genus, having a less-than-impressive caudex often, and growing somewhat sloppily."

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	LLIFLE - Encyclopedia of living forms. 2017. <i>Pachypodium saundersii</i> . <a href="http://www.llifle.com/">http://www.llifle.com/</a> . [Accessed 25 Jan 2017]	"Seeds: Numerous 6-7(-9) mm long, ovate in outline, compressed, with a apical coma (tuft of whitish or pale golden silky hairs) at one end, up to 2-2.5 cm long." ... "Blooming season: It flowers in autumn at the end of the summer growing season. It generally bloom at a younger age than other <i>Pachypodiums</i> , typically around 4-5 years old." [Unlikely. No evidence. Seeds relatively large & conspicuously tufted.]

704	Propagules adapted to wind dispersal	y
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"Seeds: grain dark to medium brown, ovate to elliptic, 7-8 x 5-5.5 mm, acute at the apex, rounded at the base; testa rough, thickened at the margin on both sides; coma whitish, sometimes straw-coloured, 2-3 cm long."
	Living Stones Nursery & Plants for the Southwest. 2017. <i>Pachypodium saundersii</i> . <a href="http://www.lithops.net/pachypodium_saundersii_detail.htm">http://www.lithops.net/pachypodium_saundersii_detail.htm</a> . [Accessed 25 Jan 2017]	"The 1 1/2-2" diameter flowers are easily hand pollinated using the typical moth mimicking technique, but are often pollinated by our resident hawk or sphinx moths. This plant was pollinated in this way, and I think way more effective than if I had attempted it. In this family the fruits (called follicles) are produced in pairs. Each fruit may contain several dozen seeds, most of which will germinate if sown during the peak of summer. As seen in the following two images, the seed is designed for wind dispersal."

705	Propagules water dispersed	n
	Source(s)	Notes

Qsn #	Question	Answer
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"Seeds: grain dark to medium brown, ovate to elliptic, 7-8 x 5-5.5 mm, acute at the apex, rounded at the base; testa rough, thickened at the margin on both sides; coma whitish, sometimes straw coloured, 2-3 cm long." [[Unlikely. Tufted seeds may be buoyant, but occurs in dry habitat]

706	Propagules bird dispersed	n
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"The seeds of <i>Pachypodium</i> spp. are provided with awns suggesting that dispersal is by wind. However, according to Keraudren (1963) wind dispersal may not be very effective because the awns of the seeds separate easily or even as soon as the fruit follicles open, and the seeds will fall on the ground near the mother plant. In addition, it is possible that insects, birds and also small rodents may disperse the seeds." [Probably No. Primarily adapted for wind dispersal]

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"The seeds of <i>Pachypodium</i> spp. are provided with awns suggesting that dispersal is by wind. However, according to Keraudren (1963) wind dispersal may not be very effective because the awns of the seeds separate easily or even as soon as the fruit follicles open, and the seeds will fall on the ground near the mother plant. In addition, it is possible that insects, birds and also small rodents may disperse the seeds." [Possibly. Hairs may adhere to fur or feathers, or rodents may cache and disperse seeds]

708	Propagules survive passage through the gut	n
	Source(s)	Notes
	Gordon, D. R., Mitterdorfer, B., Pheloung, P. C., Ansari, S., Buddenhagen, C., Chimera, C., ... & Williams, P. A. 2010). Guidance for addressing the Australian Weed Risk Assessment questions. <i>Plant Protection Quarterly</i> , 25(2): 56-74	"Answer 'no' where the taxon is unlikely to be eaten by animals or if seeds are not viable following passage through the gut."
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"The seeds of <i>Pachypodium</i> spp. are provided with awns suggesting that dispersal is by wind. However, according to Keraudren (1963) wind dispersal may not be very effective because the awns of the seeds separate easily or even as soon as the fruit follicles open, and the seeds will fall on the ground near the mother plant. In addition, it is possible that insects, birds and also small rodents may disperse the seeds." [Probably No. Seed dispersal, if any, by animals likely to occur externally]

801	Prolific seed production (>1000/m <sup>2</sup> )	n
	Source(s)	Notes

Qsn #	Question	Answer
	Nichols, G. 2005. Growing rare plants: a practical handbook on propagating the threatened plants of southern Africa. Southern African Botanical Diversity Network Report No. 36. SABONET, Pretoria	[Possibly] "The Skukuza Nursery at the Kruger National Park in South Africa grows <i>Adenium multiflorum</i> and <i>A. swazicum</i> , as well as <i>Pachypodium saundersii</i> under trees in semishade with abundant leaf litter mulch between the plants. These plants produce thousands of seeds annually."

802	Evidence that a persistent propagule bank is formed (>1 yr)	n
	Source(s)	Notes
	Bester, S. P. 2007. <i>Pachypodium</i> Lindl. PlantZAfrica. SANBI. <a href="https://www.plantzafrica.com/plantnop/pachypodium.htm">https://www.plantzafrica.com/plantnop/pachypodium.htm</a> . [Accessed 25 Jan 2017]	[Generic description] "Seeds soon lose their viability. Harvest fresh seed from the taped up pods and sow in a ± 5 mm deep, sterile, sandy medium (4 parts fine and 4 parts coarse river sand; 1 part sieved, well-rotten compost; 1 part perlite; 1 part vermiculite) in summer. Keep moist and at a temperature of 27-35°C to ensure rapid germination. All seed not germinated after 6 weeks can be regarded as nonviable."

803	Well controlled by herbicides	
	Source(s)	Notes
	WRA Specialist. 2017. Personal Communication	Unknown. No information on herbicide efficacy or chemical control of this species

804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	Notes
	WRA Specialist. 2017. Personal Communication	Unknown. Other species described as having regenerative properties.

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

- Can grow in regions with arid tropical climates
- Spiny
- Spines & sap deter animal browsing
- Genus reportedly toxic
- Reproduces by seeds
- Seeds likely dispersed by wind and people

Low Risk Traits

- No reports of invasiveness or naturalization to date
- Landscaping and ornamental value
- Prefers full sun & well-drained soil (may limit ability to escape)
- Not reported to spread vegetatively
- Reaches maturity in 4-5 years
- Seeds reported to rapidly lose viability