

**Family:** *Salicaceae*

**Taxon:** *Dovyalis caffra*

**Synonym:** *Aberia caffra* Hook. f. & Harv. (*basionym*) **Common Name:** kei apple  
wild apricot

Questionnaire :	current 20090513	Assessor:	Assessor	Designation:	H(HPWRA)
Status:	Assessor Approved	Data Entry Person:	Assessor	WRA Score	6
101	Is the species highly domesticated?		y=-3, n=0		n
102	Has the species become naturalized where grown?		y=1, n=-1		
103	Does the species have weedy races?		y=1, n=-1		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"		(0-low; 1-intermediate; 2-high) (See Appendix 2)		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		y
302	Garden/amenity/disturbance weed		n=0, y = 1*multiplier (see Appendix 2)		
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)		
305	Congeneric weed		n=0, y = 1*multiplier (see Appendix 2)		
401	Produces spines, thorns or burrs		y=1, n=0		y
402	Allelopathic		y=1, n=0		y
403	Parasitic		y=1, n=0		n
404	Unpalatable to grazing animals		y=1, n=-1		n
405	Toxic to animals		y=1, n=0		n
406	Host for recognized pests and pathogens		y=1, n=0		
407	Causes allergies or is otherwise toxic to humans		y=1, n=0		n
408	Creates a fire hazard in natural ecosystems		y=1, n=0		
409	Is a shade tolerant plant at some stage of its life cycle		y=1, n=0		y
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)		y=1, n=0		y
411	Climbing or smothering growth habit		y=1, n=0		n

412	Forms dense thickets	y=1, n=0	
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	y=1, n=-1	
604	Self-compatible or apomictic	y=1, n=-1	
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	n
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	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	n
705	Propagules water dispersed	y=1, n=-1	
706	Propagules bird dispersed	y=1, n=-1	y
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m2)	y=1, n=-1	
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	n
803	Well controlled by herbicides	y=-1, n=1	
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	y
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	

Designation: H(HPWRA)

WRA Score **6**

## Supporting Data:

101	2008. National Research Council. Lost Crops of Africa. Volume III: Fruits. National Academies Press, Washington, D.C.	[Is the species highly domesticated? No evidence] "There are few established superior cultivars, but many good ones could be quickly developed by selecting from wild or seedling populations."
102	2013. WRA Specialist. Personal Communication.	NA
103	2013. WRA Specialist. Personal Communication.	NA
201	1988. FAO. Traditional Food Plants: A Resource Book for Promoting the Exploitation & Consumption of Food Plants in Arid, Semi-arid & Sub-humid Lands of Eastern Africa. Food & Nutrition Paper 42. Food & Agriculture Organisation of the United Nations, Rome,	[Species suited to tropical or subtropical climate(s) 2-High] "Indigenous to southern Africa, Zimbabwe, Malawi, Mozambique, Kenya and Zambia."
202	1988. FAO. Traditional Food Plants: A Resource Book for Promoting the Exploitation & Consumption of Food Plants in Arid, Semi-arid & Sub-humid Lands of Eastern Africa. Food & Nutrition Paper 42. Food & Agriculture Organisation of the United Nations, Rome,	[Quality of climate match data 2-High]
203	1987. Morton, J.F.. Fruits of warm climates - Kei Apple ( <i>Dovyalis caffra</i> ). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/kei_apple_ars.html">http://www.hort.purdue.edu/newcrop/morton/kei_apple_ars.html</a> [Accessed 15 Nov 2013]	[Broad climate suitability (environmental versatility)? Yes] "The kei apple is subtropical; does poorly at sea-level in the Philippines but thrives at and above 2,600 ft (800 m). Introductions have failed to survive in Malaya. In Florida, the plant has been grown in a small way as far north as Gainesville, enduring brief drops in temperature to 20° F (-6.67° C) but descents to 16° F (-8.80° C) have been lethal in this state and in California."
203	1988. FAO. Traditional Food Plants: A Resource Book for Promoting the Exploitation & Consumption of Food Plants in Arid, Semi-arid & Sub-humid Lands of Eastern Africa. Food & Nutrition Paper 42. Food & Agriculture Organisation of the United Nations, Rome,	[Broad climate suitability (environmental versatility)? Yes] "Common from 800-1200 m, but found up to 2450 m in Kenya." [Environmental versatility - elevation range exceeds 1000 m]
203	2009. Orwa, C./Mutua, A./Kindt, R./Jamnadass, R./Simons, A.. Agroforestry Database: a tree reference and selection guide version 4.0. World Agroforestry Centre, ( <a href="http://www.worldagroforestry.org/af/treedb/">http://www.worldagroforestry.org/af/treedb/</a> )	[Broad climate suitability (environmental versatility)? Yes] "Altitude: 200-2450 m, Mean annual rainfall: 1500-3000 mm, Mean annual temperature: 11 31 deg.C" [Environmental versatility - elevation range exceeds 1000 m]
204	1988. FAO. Traditional Food Plants: A Resource Book for Promoting the Exploitation & Consumption of Food Plants in Arid, Semi-arid & Sub-humid Lands of Eastern Africa. Food & Nutrition Paper 42. Food & Agriculture Organisation of the United Nations, Rome,	[Native or naturalized in regions with tropical or subtropical climates? Yes] "Indigenous to southern Africa, Zimbabwe, Malawi, Mozambique, Kenya and Zambia."
205	1987. Morton, J.F.. Fruits of warm climates - Kei Apple ( <i>Dovyalis caffra</i> ). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/kei_apple_ars.html">http://www.hort.purdue.edu/newcrop/morton/kei_apple_ars.html</a> [Accessed 15 Nov 2013]	[Does the species have a history of repeated introductions outside its natural range? Yes] "It is cultivated in the Transvaal. In 1838, it was introduced into England and from there distributed to Egypt, Algeria, southern France and Italy, the Philippines, northwestern Australia, Jamaica, southern California and Florida."
205	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Does the species have a history of repeated introductions outside its natural range? Yes] "...widely cultivated for its edible fruit and as an impenetrable spring hedge when planted close together. The plants have become naturalized in southern Africa. It has been grown in England and Australia since 1878 and is now grown as a garden plant in Israel."
301	1997. Benson, D./McDougall, L.. Ecology of Sydney Plant Species. Part 5. Dicotyledon families Flacourtiaceae to Myrsinaceae. Cunninghamia. 5(2): 330-544.	[Naturalized beyond native range? Yes] ""Conservation: Occasionally naturalised, often persisting around old habitations"
301	2013. Hyde, M.A./Wursten, B.T./Ballings, P.. Flora of Zimbabwe: Cultivated Plants: Species information: <i>Dovyalis caffra</i> . <a href="http://www.zimbabweflora.co.zw/speciesdata/species.php?species_id=140800">http://www.zimbabweflora.co.zw/speciesdata/species.php?species_id=140800</a> [Accessed 19 Nov 2013]	[Naturalized beyond native range? Yes] "Trees are often planted as hedge plants and for the edible fruits and have become naturalised in many areas outside their natural habitats, usually close to habitation. "

302	2012. Queensland Government. Waterwise Plant Selector - Kei Apple ( <i>Dovyalis caffra</i> ). <a href="http://www.nrm.qld.gov.au/waterwise/plantselector/before-planting/details.php?plant_id=1785">http://www.nrm.qld.gov.au/waterwise/plantselector/before-planting/details.php?plant_id=1785</a> [Accessed 20 Nov 2013]	[Garden/amenity/disturbance weed? Possibly. Impacts unspecified] "This plant is considered a weed in some parts of Queensland. Check with your local Council before planting."
302	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Garden/amenity/disturbance weed? Listed as a weed of unspecified impacts]
303	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Agricultural/forestry/horticultural weed? No evidence]
304	2003. Hacker, B.. Kei apple – <i>Dovyalis caffra</i> – yet another thorny weed?. The Node Newsletter of BRAIN — The Brisbane Rainforest Action & Information Network. 24: 5.	[Environmental weed? Potentially] "Driving through the Moggill area recently, I noted several shrubs which were clearly flourishing in the drought and also did not appear to be native. At the Queensland Herbarium a specimen was identified for me as <i>Dovyalis caffra</i> , the kei apple (kei pronounced as in 'my'). Several shrubs were fruiting heavily, whereas others lacked fruit. I am told that there is one area near Moggill where this species has formed a thicket, and it appears to be in the early stages of naturalisation. Being an exceedingly thorny species it could become an undesirable environmental weed. An internet search revealed some interesting facts about this plant."
305	2005. Staples, G.W./Herbst, D.R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Congeneric weed? Possibly] " <i>Dovyalis hebecarpa</i> " ... "In southern Florida, plantings have mostly been eradicated because the shrubs proved to be too aggressive in cultivation."
305	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Congeneric weed? Possibly <i>Dovyalis hebecarpa</i> ]
401	1987. Morton, J.F.. Fruits of warm climates - Kei Apple ( <i>Dovyalis caffra</i> ). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/kei_apple_ars.html">http://www.hort.purdue.edu/newcrop/morton/kei_apple_ars.html</a> [Accessed 15 Nov 2013]	[Produces spines, thorns or burrs? Yes] "The shrub or small tree, growing to a height of 30 ft (9 m) with a spread of 25 ft (7.5 m), usually has many sharp spines 1 to 3 in (2.5-7.5 cm) long, though it is often entirely spineless if not trimmed. The leaves, often clustered on short spurs, are oblong-obovate, 1 to 3 in (2.5-7.5 cm) long, glossy and short petioled."
401	2008. Kobayashi, K./Criley, R./Kaufman, A./Tsugawa, S./Ricordi, A./Clifford, P.. Barrier Plants. L-20. College of Tropical Agriculture and Human Resources (CTAHR, Honolulu, HI <a href="http://www.ctahr.hawaii.edu/freepubs">http://www.ctahr.hawaii.edu/freepubs</a>	[Produces spines, thorns or burrs? Yes] "This small, moderately fast-growing tree reaches to 20 feet high, with sharp, long stem spines in the leaf axils. Buds at the base of the spine produce clusters of alternately arranged, simple, glossy, ovate leaves."
402	1987. Morton, J.F.. Fruits of warm climates - Kei Apple ( <i>Dovyalis caffra</i> ). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/kei_apple_ars.html">http://www.hort.purdue.edu/newcrop/morton/kei_apple_ars.html</a> [Accessed 15 Nov 2013]	[Allelopathic? Yes] "Weeding should not be a problem, for the kei apple exhibits allelopathy, that is, its roots excrete growth inhibitors which prevent the occurrence of other plants in its vicinity. Investigators in Egypt have demonstrated that the roots, stem and fruit, but not the leaves and branches, possess antibiotic properties."
402	2008. National Research Council. Lost Crops of Africa. Volume III: Fruits. National Academies Press, Washington, D.C.	[Allelopathic? Yes] "This does not seem to be a good crop for agroforestry. The plant exhibits allelopathy, its roots excreting chemicals that discourage the growth of other plants in its vicinity."
403	2009. Orwa, C./Mutua, A./Kindt, R./Jamnadass, R./Simons, A.. Agroforestry Database: a tree reference and selection guide version 4.0. World Agroforestry Centre, ( <a href="http://www.worldagroforestry.org/af/treedb/">http://www.worldagroforestry.org/af/treedb/</a> )	[Parasitic? No] " <i>Dovyalis caffra</i> is a shrub or small evergreen tree, usually 3-5 m in height, but sometimes reaching 8 m. Bark grey, smooth on young branchlets but fissured and flaky to corky on old branches and stems. Young branches heavily armed with long (40-70 mm) spines, but stem with few spines. Crown much branched. Root system is not aggressive." [Salicaceae. Also placed in: Flacourtiaceae]
404	2003. South African National Biodiversity Institute. PlantzAfrica.com - <i>Dovyalis caffra</i> . <a href="http://www.plantzfrica.com/plantcd/dovycaf.htm">http://www.plantzfrica.com/plantcd/dovycaf.htm</a> [Accessed 15 Nov 2013]	[Unpalatable to grazing animals? Leaves are palatable, but spines may deter browsing] "It is a tree or spiny shrub of moderate growth rate that may be planted close together to form a good hedge." ... " <i>Dovyalis caffra</i> can be cultivated as a border, screen or used to form an impenetrable hedge around a garden to keep unwanted animals and people out." ... "The leaves are used as fodder (bulk feed for livestock)."
404	2008. National Research Council. Lost Crops of Africa. Volume III: Fruits. National Academies Press, Washington, D.C.	[Unpalatable to grazing animals? No] "The plant provides good cattle fodder, made more valuable in harsh locations by the plant's resistance to extreme heat and drought. Because of the spines, livestock leave the foliage untouched until the desperate times arrive. This "bankable" fodder feature is invaluable. In Transkei, for example, kei-apple stock enclosures become critical for saving animals from starvation in the depths of the dry season."

404	2009. Orwa, C./Mutua, A./Kindt, R./Jamnadass, R./Simons, A.. Agroforestry Database: a tree reference and selection guide version 4.0. World Agroforestry Centre, ( <a href="http://www.worldagroforestry.org/af/treedb/">http://www.worldagroforestry.org/af/treedb/</a> )	[Unpalatable to grazing animals? No] "Fodder: Leaves are eaten by cattle, goats and game."
405	1988. FAO. Traditional Food Plants: A Resource Book for Promoting the Exploitation & Consumption of Food Plants in Arid, Semi-arid & Sub-humid Lands of Eastern Africa. Food & Nutrition Paper 42. Food & Agriculture Organisation of the United Nations, Rome,	[Toxic to animals? No evidence] "Leaves are used as forage"
405	2002. Schmidt, E./Lötter, M./McClelland, W.. Trees and shrubs of Mpumalanga and Kruger National Park. Jacana Media, Johannesburg, South Africa	[Toxic to animals? No] "Leaves browsed by antelope."
405	2003. South African National Biodiversity Institute. PlantzAfrica.com - <i>Dovyalis caffra</i> . <a href="http://www.plantzafrika.com/plantcd/dovycaf.htm">http://www.plantzafrika.com/plantcd/dovycaf.htm</a> [Accessed 15 Nov 2013]	[Toxic to animals? No evidence] "The leaves are used as fodder (bulk feed for livestock). The fruits are edible and make excellent jam."
406	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Host for recognized pests and pathogens?] "The ripe fruit is popular with birds. Fruit is attacked by the fruit fly, whose larvae breed in them. Larvae of the African leopard butterfly, <i>Phalanta phalanta</i> , feed on the leaves."
406	2011. Sibusisiwe, N.. Kei Apple. Department: Agriculture, Forestry and Fisheries, Pretoria, South Africa <a href="http://www.daff.gov.za/docs/Brochures/KeiApple.pdf">www.daff.gov.za/docs/Brochures/KeiApple.pdf</a>	"The fruit is attacked by the fruit fly and larvae of the African leopard butterfly feed on the leaves. Sanitation is important in reducing overall fruit fly densities. Removal of old fruit remaining on trees following harvest and burial of all fruit on the ground is recommended."
407	2002. Schmidt, E./Lötter, M./McClelland, W.. Trees and shrubs of Mpumalanga and Kruger National Park. Jacana Media, Johannesburg, South Africa	[Causes allergies or is otherwise toxic to humans? No evidence] "Fruit edible, with a high vitamin C content, and makes an excellent jam; green fruits pickled. Widely cultivated for fruits and as a hedge. Leaves browsed by antelope."
407	2003. South African National Biodiversity Institute. PlantzAfrica.com - <i>Dovyalis caffra</i> . <a href="http://www.plantzafrika.com/plantcd/dovycaf.htm">http://www.plantzafrika.com/plantcd/dovycaf.htm</a> [Accessed 15 Nov 2013]	[Causes allergies or is otherwise toxic to humans? No evidence] "The leaves are used as fodder (bulk feed for livestock). The fruits are edible and make excellent jam."
408	2005. Loffler, L./Loffler, P.. Swaziland Tree Atlas—including selected shrubs and climbers. Southern African Botanical Diversity Network Report No. 38. SABONET, Pretoria, S.A.	[Creates a fire hazard in natural ecosystems? Unknown] "Habitat: Bushveld, thicket, woodland, and wooded grassland. Often associated with termitaria." [There is no evidence to suggest that <i>D. caffra</i> contributes to an increased fire risk, but if it forms thickets, this could facilitate the spread of fire]
409	2003. South African National Biodiversity Institute. PlantzAfrica.com - <i>Dovyalis caffra</i> . <a href="http://www.plantzafrika.com/plantcd/dovycaf.htm">http://www.plantzafrika.com/plantcd/dovycaf.htm</a> [Accessed 15 Nov 2013]	[Is a shade tolerant plant at some stage of its life cycle? Yes] "It will grow well in either full sun or light shade and will also need regular trimming in order to maintain a good hedge."
409	2009. Orwa, C./Mutua, A./Kindt, R./Jamnadass, R./Simons, A.. Agroforestry Database: a tree reference and selection guide version 4.0. World Agroforestry Centre, ( <a href="http://www.worldagroforestry.org/af/treedb/">http://www.worldagroforestry.org/af/treedb/</a> )	[Is a shade tolerant plant at some stage of its life cycle? Yes. Light shade] "It also responds well to pruning and grows well in either full sun or light shade."
410	1987. Morton, J.F.. Fruits of warm climates - Kei Apple ( <i>Dovyalis caffra</i> ). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/kei_apple_ars.html">http://www.hort.purdue.edu/newcrop/morton/kei_apple_ars.html</a> [Accessed 15 Nov 2013]	[Tolerates a wide range of soil conditions? Yes] "The kei apple does well in almost any soil that does not have a high water table. It is extremely drought-resistant and tolerates saline soil and salt spray and is accordingly valued as a coastal hedge in the Mediterranean region and in California."
410	1988. FAO. Traditional Food Plants: A Resource Book for Promoting the Exploitation & Consumption of Food Plants in Arid, Semi-arid & Sub-humid Lands of Eastern Africa. Food & Nutrition Paper 42. Food & Agriculture Organisation of the United Nations, Rome,	[Tolerates a wide range of soil conditions ? Yes] "Prefers well-drained soils, but also tolerates loamy clays and is adaptable to almost any soil conditions that are not too wet."
410	2011. Sibusisiwe, N.. Kei Apple. Department: Agriculture, Forestry and Fisheries, Pretoria, South Africa <a href="http://www.daff.gov.za/docs/Brochures/KeiApple.pdf">www.daff.gov.za/docs/Brochures/KeiApple.pdf</a>	[Tolerates a wide range of soil conditions? Yes] "Kei apple is adapted to many varieties of soil, from sandy to loamy clay soils with a preference for well drained and aerated soil. However, the tree can grow well in poor soils. The tree grows well at a pH of 5, 5 to 8, 5."
411	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Climbing or smothering growth habit? No] "This dioecious shrub or small, evergreen tree is usually 3-5 m in height with a many branched crown."

412	2003. Hacker, B.. Kei apple – <i>Dovyalis caffra</i> – yet another thorny weed?. The Node Newsletter of BRAIN — The Brisbane Rainforest Action & Information Network. 24: 5.	[Forms dense thickets? Possibly] "I am told that there is one area near Moggill where this species has formed a thicket, and it appears to be in the early stages of naturalisation."
412	2005. Loffler, L./Loffler, P.. Swaziland Tree Atlas—including selected shrubs and climbers. Southern African Botanical Diversity Network Report No. 38. SABONET, Pretoria, S.A.	[Forms dense thickets? Unknown. Possibly a component of thicket vegetation] "Habitat: Bushveld, thicket, woodland, and wooded grassland. Often associated with termitaria."
501	2003. South African National Biodiversity Institute. PlantzAfrica.com - <i>Dovyalis caffra</i> . <a href="http://www.plantzafrica.com/plantcd/dovycaf.htm">http://www.plantzafrica.com/plantcd/dovycaf.htm</a> [Accessed 15 Nov 2013]	[Aquatic? No] "It grows in valley bushveld, dry areas, wooded grassland, on forest edges, from Eastern Cape through KwaZulu-Natal to Swaziland, into Limpopo [Northern Province] and Zimbabwe."
502	2013. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	[Grass? No] Salicaceae. Also placed in: Flacourtiaceae
503	2013. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	[Nitrogen fixing woody plant? No] Salicaceae. Also placed in: Flacourtiaceae
504	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] "This dioecious shrub or small, evergreen tree is usually 3-5 m in height with a many branched crown."
601	1987. Morton, J.F.. Fruits of warm climates - Kei Apple ( <i>Dovyalis caffra</i> ). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/kei_apple_ars.html">http://www.hort.purdue.edu/newcrop/morton/kei_apple_ars.html</a> [Accessed 15 Nov 2013]	[Evidence of substantial reproductive failure in native habitat? No] "The kei apple is native to the Kei River area of southwest Africa and abundant in the wild around the eastern Cape, Kaffraria and Natal."
602	2003. South African National Biodiversity Institute. PlantzAfrica.com - <i>Dovyalis caffra</i> . <a href="http://www.plantzafrica.com/plantcd/dovycaf.htm">http://www.plantzafrica.com/plantcd/dovycaf.htm</a> [Accessed 15 Nov 2013]	[Produces viable seed? Yes] "The Kei-apple is easily propagated from seed."
602	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Produces viable seed? Yes] "The recalcitrant seeds when sown fresh germinate readily within 18-20 days and are easily transplanted."
603	2008. National Research Council. Lost Crops of Africa. Volume III: Fruits. National Academies Press, Washington, D.C.	[Hybridizes naturally? Unknown. Hybrids occur within genus] "Two hybrids between <i>Dovyalis</i> species are known. One appeared at USDA Miami in 1951 when a female plant of <i>D. abyssinica</i> was pollinated by a nearby male <i>D. hebecarpa</i> . The progeny (sometimes called Florida gooseberry) are more vigorous, productive, and cold tolerant than either parent... This natural hybrid has been distributed by the USDA as seedlings of P.I. 112086, <i>Dovyalis abyssinica</i> . ... " <i>Dovyalis caffra</i> " ... "Combining this species with others in its genus holds the potential for creating hybrid fruits of high market and culinary appeal. This challenging area offers more than merely interesting possibilities. Innovative amateur and professional horticulturists could find highly satisfying endeavors awaiting them here"
604	1987. Morton, J.F.. Fruits of warm climates - Kei Apple ( <i>Dovyalis caffra</i> ). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/kei_apple_ars.html">http://www.hort.purdue.edu/newcrop/morton/kei_apple_ars.html</a> [Accessed 15 Nov 2013]	[Self-compatible or apomictic? Possibly No. "Female" trees sometimes produce seeds] "Pale-yellow male and female flowers are usually borne on separate trees. They are small, petalless, and clustered in the leaf axils." ... "According to Popenoe there should be 1 male for every 20 or 30 females. However, certain female trees have borne profusely in the absence of male pollinators."
604	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Self-compatible or apomictic? Possibly No] "This dioecious shrub or small, evergreen tree is usually 3-5 m in height with a many-branched crown."
604	2008. National Research Council. Lost Crops of Africa. Volume III: Fruits. National Academies Press, Washington, D.C.	[Self-compatible or apomictic? Possibly in rare instances] "Perfect-flowered plants are known to exist. These very rare specimens have both male and female flowers on the same plant. In commerce these self-fertile specimens may have particular value because they remove the complexity of obtaining, placing, and planting males for pollination. These dual-gender plants should be sought out, studied, and developed."
605	2003. South African National Biodiversity Institute. PlantzAfrica.com - <i>Dovyalis caffra</i> . <a href="http://www.plantzafrica.com/plantcd/dovycaf.htm">http://www.plantzafrica.com/plantcd/dovycaf.htm</a> [Accessed 15 Nov 2013]	[Requires specialist pollinators? No] "Insects and birds play a very important role in pollinating this tree."
605	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Requires specialist pollinators? No] "The flowers are pollinated by insects."

606	1987. Morton, J.F.. Fruits of warm climates - Kei Apple ( <i>Dovyalis caffra</i> ). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/kei_apple_ars.html">http://www.hort.purdue.edu/newcrop/morton/kei_apple_ars.html</a> [Accessed 15 Nov 2013]	[Reproduction by vegetative fragmentation? No evidence] "Propagation is ordinarily by seeds, though layering is successfully done in Australia."
606	2011. Sibusisiwe, N.. Kei Apple. Department: Agriculture, Forestry and Fisheries, Pretoria, South Africa <a href="http://www.daff.gov.za/docs/Brochures/KeiApple.pdf">www.daff.gov.za/docs/Brochures/KeiApple.pdf</a>	[Reproduction by vegetative fragmentation? No] "Kei apple is easily propagated from seed and can also be propagated from hardwood cuttings provided they are treated with a root stimulating hormone before planting."
607	1987. Morton, J.F.. Fruits of warm climates - Kei Apple ( <i>Dovyalis caffra</i> ). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/kei_apple_ars.html">http://www.hort.purdue.edu/newcrop/morton/kei_apple_ars.html</a> [Accessed 15 Nov 2013]	[Minimum generative time (years)? 4+] "Seeds germinate readily when fresh and seedlings begin to bear in 4 or 5 years."
607	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Minimum generative time (years)? 3] "The tree does not fruit until it is 3 years old."
701	2009. Orwa, C./Mutua, A./Kindt, R./Jamnadass, R./Simons, A.. Agroforestry Database: a tree reference and selection guide version 4.0. World Agroforestry Centre, ( <a href="http://www.worldagroforestry.org/af/treedb/">http://www.worldagroforestry.org/af/treedb/</a> )	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? No. Unlikely. No evidence and no means of external attachment] "Fruit almost spherical, up to 6 cm in diameter, fleshy, turning from green to yellow-orange with a velvety surface when mature, crowned with persistent styles containing seeds 10 mm long. About 12 hairy seeds in 2 circles are enclosed in the pulp"
702	2008. Kobayashi, K./Criley, R./Kaufman, A./Tsugawa, S./Ricordi, A./Clifford, P.. Barrier Plants. L-20. College of Tropical Agriculture and Human Resources (CTAHR, Honolulu, HI <a href="http://www.ctahr.hawaii.edu/freepubs">http://www.ctahr.hawaii.edu/freepubs</a>	[Propagules dispersed intentionally by people? Yes] "It is used in hedges."
703	2009. Orwa, C./Mutua, A./Kindt, R./Jamnadass, R./Simons, A.. Agroforestry Database: a tree reference and selection guide version 4.0. World Agroforestry Centre, ( <a href="http://www.worldagroforestry.org/af/treedb/">http://www.worldagroforestry.org/af/treedb/</a> )	[Propagules likely to disperse as a produce contaminant? No] "Fruit almost spherical, up to 6 cm in diameter, fleshy, turning from green to yellow-orange with a velvety surface when mature, crowned with persistent styles containing seeds 10 mm long. About 12 hairy seeds in 2 circles are enclosed in the pulp" [No evidence]
704	2009. Orwa, C./Mutua, A./Kindt, R./Jamnadass, R./Simons, A.. Agroforestry Database: a tree reference and selection guide version 4.0. World Agroforestry Centre, ( <a href="http://www.worldagroforestry.org/af/treedb/">http://www.worldagroforestry.org/af/treedb/</a> )	[Propagules adapted to wind dispersal? No] "Fruit almost spherical, up to 6 cm in diameter, fleshy, turning from green to yellow-orange with a velvety surface when mature, crowned with persistent styles containing seeds 10 mm long. About 12 hairy seeds in 2 circles are enclosed in the pulp"
705	1997. Benson, D./McDougall, L.. Ecology of Sydney Plant Species. Part 5. Dicotyledon families Flacourtiaceae to Myrsinaceae. Cunninghamia. 5(2): 330-544.	[Propagules water dispersed? Possibly. Occurs in riparian areas] "Vegetation: Weedy, riparian vegetation e.g. with <i>Angophora floribunda</i> , <i>Acacia parramattensis</i> , <i>Melaleuca styphelioides</i> ."
705	2013. Vromans, D.C.. Ecological Specialist Report for the Proposed Construction of a Slipway along the Mthatha River, Eastern Cape. Conservation Support Services, Grahamstown, South Africa	[Propagules water dispersed? Possibly Yes] "The indigenous Kei Apple ( <i>Dovyalis caffra</i> ) and the River Bushwillow ( <i>Combretum erythrophyllum</i> ) grow along the river, although alien invasive species are common and include <i>Sesbania punicea</i> , <i>Lantana camara</i> , <i>Solanum mauritianum</i> and <i>Eichhornia crassipes</i> (water hyacinth)."
706	2003. South African National Biodiversity Institute. PlantzAfrica.com - <i>Dovyalis caffra</i> . <a href="http://www.plantzafrika.com/plantcd/dovycaf.htm">http://www.plantzafrika.com/plantcd/dovycaf.htm</a> [Accessed 15 Nov 2013]	[Propagules bird dispersed? Yes] "Birds such as the louries and the black-eyed bulbuls love the fruits of a <i>Dovyalis caffra</i> , which are delicious. By eating the fruits birds also help to distribute the seeds."
707	2003. South African National Biodiversity Institute. PlantzAfrica.com - <i>Dovyalis caffra</i> . <a href="http://www.plantzafrika.com/plantcd/dovycaf.htm">http://www.plantzafrika.com/plantcd/dovycaf.htm</a> [Accessed 15 Nov 2013]	[Propagules dispersed by other animals (externally)? No. Adapted for internal dispersal] "Birds such as the louries and the black-eyed bulbuls love the fruits of a <i>Dovyalis caffra</i> , which are delicious. By eating the fruits birds also help to distribute the seeds. Baboons, antelope and monkeys also like to eat the fruit."
708	2003. South African National Biodiversity Institute. PlantzAfrica.com - <i>Dovyalis caffra</i> . <a href="http://www.plantzafrika.com/plantcd/dovycaf.htm">http://www.plantzafrika.com/plantcd/dovycaf.htm</a> [Accessed 15 Nov 2013]	[Propagules survive passage through the gut? Presumably Yes] "Birds such as the louries and the black-eyed bulbuls love the fruits of a <i>Dovyalis caffra</i> , which are delicious. By eating the fruits birds also help to distribute the seeds. Baboons, antelope and monkeys also like to eat the fruit."
801	2009. Orwa, C./Mutua, A./Kindt, R./Jamnadass, R./Simons, A.. Agroforestry Database: a tree reference and selection guide version 4.0. World Agroforestry Centre, ( <a href="http://www.worldagroforestry.org/af/treedb/">http://www.worldagroforestry.org/af/treedb/</a> )	[Prolific seed production (>1000/m <sup>2</sup> )? Unknown] "Fruit almost spherical, up to 6 cm in diameter, fleshy, turning from green to yellow-orange with a velvety surface when mature, crowned with persistent styles containing seeds 10 mm long. About 12 hairy seeds in 2 circles are enclosed in the pulp; these distinguish the kei apple from the thorn pear fruit which is similar (the thorn pear fruit has only 1-3 seeds)."

802	1988. FAO. Traditional Food Plants: A Resource Book for Promoting the Exploitation & Consumption of Food Plants in Arid, Semi-arid & Sub-humid Lands of Eastern Africa. Food & Nutrition Paper 42. Food & Agriculture Organisation of the United Nations, Rome,	[Evidence that a persistent propagule bank is formed (>1 yr)? No] "Ideally, seeds should be sown immediately in nursery beds, since they germinate readily when fresh but lose viability within 3 months after picking."
802	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Evidence that a persistent propagule bank is formed (>1 yr)? Possibly No] "The recalcitrant seeds when sown fresh germinate readily within 18-20 days and are easily transplanted."
803	2013. WRA Specialist. Personal Communication.	[Well controlled by herbicides? Unknown] No information on herbicide efficacy or chemical control of this species
804	1987. Morton, J.F.. Fruits of warm climates - Kei Apple ( <i>Dovyalis caffra</i> ). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/kei_apple_ars.html">http://www.hort.purdue.edu/newcrop/morton/kei_apple_ars.html</a> [Accessed 15 Nov 2013]	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes] "A kei apple hedge must be trimmed twice a year. If neglected and allowed to become leggy, it can be cut to the ground and given a new start."
804	2008. National Research Council. Lost Crops of Africa. Volume III: Fruits. National Academies Press, Washington, D.C.	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes. Tolerates heavy pruning] "For optimum fruit production they need heavy pruning, no easy task with such a spiky species. For one thing, the crown needs frequent thinning because the branches tend to crowd toward the center, ending up in congested tangles of unproductive shoots."
804	2009. Orwa, C./Mutua, A./Kindt, R./Jamnadass, R./Simons, A.. Agroforestry Database: a tree reference and selection guide version 4.0. World Agroforestry Centre, ( <a href="http://www.worldagroforestry.org/af/treedb/">http://www.worldagroforestry.org/af/treedb/</a> )	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes] "It also responds well to pruning and grows well in either full sun or light shade."
805	2013. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol agents)? Unknown]



## **Summary of Risk Traits**

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

- Grows in subtropical climates
- Elevation range exceeds 1000 m
- Naturalized in Australia and outside native range in Africa
- Regarded as a weed of unspecified impacts
- Possesses sharp, long stem spines in the leaf axils
- Allelopathic
- Tolerates light shade
- Tolerates many soil types
- Seeds dispersed by birds and fruit-eating mammals
- Becomes reproductively mature in 3+ years
- Tolerates heavy pruning

### **Low Risk Traits**

- Despite spines, foliage is palatable to browsing animals and is used as fodder
- Fruit edible to animals and people
- Used as a living fence and barrier plant
- Trees typically dioecious (although monoecious trees sometimes occur)
- Seeds are recalcitrant and will not persist in the soil