

<b>Taxon:</b> Solanum pseudocapsicum	<b>Family:</b> Solanaceae
<b>Common Name(s):</b> false capsicum false Jerusalem cherry Jerusalem cherry Madeira winter cherry winter cherry	<b>Synonym(s):</b> Solanum capsicastrum Link ex Solanum diflorum Vell. Solanum jaliscanum Greenm. Solanum tucumanense Griseb.

<b>Assessor:</b> Chuck Chimera	<b>Status:</b> Assessor Approved	<b>End Date:</b> 17 Aug 2015
<b>WRA Score:</b> 16.0	<b>Designation:</b> H(HPWRA)	<b>Rating:</b> High Risk

**Keywords:** Naturalized, Environmental Weed, Toxic, Fleshy-Fruited, Bird-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	y
302	Garden/amenity/disturbance weed		
303	Agricultural/forestry/horticultural weed		
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		
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	y
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	y

Qsn #	Question	Answer Option	Answer
408	Creates a fire hazard in natural ecosystems		
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)		
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	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	y=1, n=-1	y
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	y=1, n=-1	n
704	Propagules adapted to wind dispersal	y=1, n=-1	n
705	Propagules water dispersed		
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/m <sup>2</sup> )		
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
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[No evidence] "Probably native to eastern Argentina, but widely and early cultivated as an ornamental and now naturalized in many warm temperate and tropical areas worldwide"
102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	NA
103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. 2015. 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, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: <a href="http://www.ars-grin.gov/">http://www.ars-grin.gov/</a> . [Accessed 17 Aug 2015]	"Native: NORTHERN AMERICA Northern Mexico: Mexico - San Luis Potosi, Tamaulipas Southern Mexico: Mexico - Hidalgo, Jalisco, Michoacan, Nayarit, Oaxaca, Puebla, Queretaro, Veracruz SOUTHERN AMERICA Caribbean: Trinidad and Tobago Mesoamerica: Guatemala Brazil: Brazil - Federal District, Goias, Mato Grosso, Minas Gerais, Parana, Rio Grande do Sul, Rio de Janeiro, Santa Catarina, Sao Paulo Western South America: Bolivia; Ecuador; Peru Southern South America: Argentina - Buenos Aires [n.], Catamarca, Cordoba, Corrientes, Entre Rios, Formosa, Jujuy, La Rioja, Misiones, Salta, Tucuman; Chile; Paraguay; Uruguay"
202	Quality of climate match data	High
	Source(s)	Notes
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: <a href="http://www.ars-grin.gov/">http://www.ars-grin.gov/</a> . [Accessed 17 Aug 2015]	
203	Broad climate suitability (environmental versatility)	y

Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Learn 2 Grow. 2015. <i>Solanum pseudocapsicum</i> 'Variegatum'. <a href="http://www.learn2grow.com/plants/solanum-pseudocapsicum-variegatum/">http://www.learn2grow.com/plants/solanum-pseudocapsicum-variegatum/</a> . [Accessed 17 Aug 2015]	"USDA Hardiness Zone: 11 - 15"
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Elevation range exceeds 1000 m in the Hawaiian Islands] "in Hawai'i naturalized in disturbed sites in mesic forest, grassy pastures, along seasonal streams, and in open or shaded woods, 600-2,100 m,"
	Khuroo, A. A., Weber, E., Malik, A. H., Reshi, Z. A., & Dar, G. H. (2011). Altitudinal distribution patterns of the native and alien woody flora in Kashmir Himalaya, India. <i>Environmental Research</i> , 111(7): 967-977	[Elevation range exceeds 1000 m] "Alien and native species significantly differed in their altitudinal limits and ranges (Table 2). Alien species did not reach such high altitudes as did native species. The maximum altitudes of alien species were 3300masl ( <i>Solanum pseudocapsicum</i> ), a shrub," ... "Appendix B. List of alien and native woody species of Kashmir Himalaya, India." [ <i>Solanum pseudocapsicum</i> - Altitudes (m) = 1400–3300]

204	Native or naturalized in regions with tropical or subtropical climates	y
	<b>Source(s)</b>	<b>Notes</b>
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: <a href="http://www.ars-grin.gov/">http://www.ars-grin.gov/</a> . [Accessed 17 Aug 2015]	"Native: NORTHERN AMERICA Northern Mexico: Mexico - San Luis Potosi, Tamaulipas Southern Mexico: Mexico - Hidalgo, Jalisco, Michoacan, Nayarit, Oaxaca, Puebla, Queretaro, Veracruz SOUTHERN AMERICA Caribbean: Trinidad and Tobago Mesoamerica: Guatemala Brazil: Brazil - Federal District, Goias, Mato Grosso, Minas Gerais, Parana, Rio Grande do Sul, Rio de Janeiro, Santa Catarina, Sao Paulo Western South America: Bolivia; Ecuador; Peru Southern South America: Argentina - Buenos Aires [n.], Catamarca, Cordoba, Corrientes, Entre Rios, Formosa, Jujuy, La Rioja, Misiones, Salta, Tucuman; Chile; Paraguay; Uruguay Naturalized: AFRICA Macaronesia: Portugal - Azores, Madeira Islands; Spain - Canary Islands Southern Africa: Lesotho; South Africa AUSTRALASIA Australia: Australia New Zealand: New Zealand PACIFIC North-Central Pacific: United States - Hawaii SOUTHERN AMERICA South America [s.]"

Qsn #	Question	Answer
205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Probably native to eastern Argentina, but widely and early cultivated as an ornamental and now naturalized in many warm temperate and tropical areas worldwide"

301	Naturalized beyond native range	y
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"in Hawai'i naturalized in disturbed sites in mesic forest, grassy pastures, along seasonal streams, and in open or shaded woods, 600 -2,100 m, on O'ahu, Moloka'i, Maui, and Hawai'i. First collected on Moloka'i prior to 1871 (Hillebrand s.n., BM), but reported by Hillebrand (1888) as established on all 3 islands; therefore, it was probably introduced much earlier than 1871."
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: <a href="http://www.ars-grin.gov/">http://www.ars-grin.gov/</a> . [Accessed 14 Aug 2015]	"Naturalized: AFRICA Macaronesia: Portugal - Azores, Madeira Islands; Spain - Canary Islands Southern Africa: Lesotho; South Africa AUSTRALASIA Australia: Australia New Zealand: New Zealand PACIFIC North-Central Pacific: United States - Hawaii SOUTHERN AMERICA South America [s.]"
	Murray, B. R., & Phillips, M. L. (2010). Investment in seed dispersal structures is linked to invasiveness in exotic plant species of south eastern Australia. <i>Biological Invasions</i> , 12 (7): 2265-2275	"Table 1 The dataset of naturalized exotic plant species of Royal National Park (south-eastern Australia) and attribute values for invasion status" [Includes <i>Solanum pseudocapsicum</i> ]
	Queensland Government. 2011. Weeds of Australia - Madeira winter cherry - <i>Solanum pseudocapsicum</i> . <a href="http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Solanum_pseudocapsicum.htm">http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Solanum_pseudocapsicum.htm</a> . [Accessed 17 Aug 2015]	"Widely naturalised in southern and eastern Australia (i.e. in south-eastern Queensland, New South Wales, Victoria, Tasmania and many parts of south-eastern and southern South Australia). Also occasionally recorded in northern Queensland and northern Western Australia."

302	Garden/amenity/disturbance weed	
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Disturbance adapted environmental weed] "in Hawai'i naturalized in disturbed sites in mesic forest, grassy pastures, along seasonal streams, and in open or shaded woods, 600-2,100 m,"

303	Agricultural/forestry/horticultural weed	
	Source(s)	Notes

Qsn #	Question	Answer
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Occurrence in pastures & toxicity could impact ranching] "in Hawai'i naturalized in disturbed sites in mesic forest, grassy pastures, along seasonal streams, and in open or shaded woods"
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	Included in a reference of agricultural weeds

304	Environmental weed	y
	Source(s)	Notes
	Weedbusters. 2015. Jerusalem Cherry. <i>Solanum pseudocapsicum</i> and <i>Solanum diflorum</i> . <a href="http://www.weedbusters.org.nz/weed-information/solanum-pseudocapsicum/59/">http://www.weedbusters.org.nz/weed-information/solanum-pseudocapsicum/59/</a> . [Accessed 17 Aug 2015]	"Can form dense stands in disturbed (especially grazed) forest and shrubland. Usually succeeded with competition for ground space."
	Weber, E. 2003. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	"Forests and forest edges, riparian habitats. Where native, this plant is common in grassland, thickets, and disturbed places. Where invasive, it becomes abundant and forms dense patches that crowd out native plants and prevent the regeneration of shrubs and trees."
	Queensland Government. 2011. Weeds of Australia - Madeira winter cherry - <i>Solanum pseudocapsicum</i> . <a href="http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Solanum_pseudocapsicum.htm">http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Solanum_pseudocapsicum.htm</a> . [Accessed 17 Aug 2015]	"Most often a weed of closed forests, forest margins and waterways in temperate and sub-tropical regions, but is occasionally also found in semi-arid and tropical environments." ... "Madeira winter cherry ( <i>Solanum pseudocapsicum</i> ) is regarded as a significant environmental weed in Victoria and as an environmental weed in New South Wales."
	Tunison, J.T. & Stone, C.P. 1992. Special Ecological Areas: An Approach to Alien Plant Control in Hawaii Volcanoes National Park. Pp. 781-798 in Stone et al. (eds.). Alien Plant Invasions in Native Ecosystems of Hawai'i: Management and Research. CPSU, University of Hawaii, Honolulu, HI	[Controlled in SEAs] "Eleven alien plant species were targeted for control in Special Ecological Areas: firetree, kahili ginger, strawberry guava, banana poka, Jerusalem cherry ( <i>Solanum pseudocapsicum</i> ), palm grass ( <i>Setaria palmifolia</i> ), silk oak, olive ( <i>Olea europaea</i> subsp. <i>africana</i> ), fountain grass ( <i>Pennisetum setaceum</i> ), yellow Himalayan raspberry ( <i>Rubus ellipticus</i> ), and nasturtium ( <i>Tropaeolum majus</i> )."

305	Congeneric weed	y
	Source(s)	Notes
	USDA Natural Resources Conservation Service. 2014. Federal Noxious Weed List. <a href="http://plants.usda.gov/java/noxious">http://plants.usda.gov/java/noxious</a> . [Accessed 17 Aug 2015]	Federal noxious weeds include: <i>Solanum tampicense</i> , <i>Solanum torvum</i> & <i>Solanum viarum</i>
	USDA Natural Resources Conservation Service. 2015. Hawaii State-listed Noxious Weeds. <a href="http://plants.usda.gov/java/noxious?rptType=State&amp;statefips=15">http://plants.usda.gov/java/noxious?rptType=State&amp;statefips=15</a> . [Accessed 17 Aug 2015]	Hawaii State-listed Noxious Weeds include: <i>Solanum carolinense</i> L., <i>Solanum elaeagnifolium</i> Cav., <i>Solanum robustum</i> Wendl. & <i>Solanum torvum</i> Sw.
	Weber, E. 2003. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	<i>Solanum laxum</i> , <i>Solanum linnaeanum</i> , <i>Solanum mauritianum</i> , <i>Solanum nigrum</i> , <i>Solanum tampicense</i> , <i>Solanum viarum</i> listed as weeds of natural areas

401	Produces spines, thorns or burrs	n
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Unarmed] "Erect shrubs up to 1.5 m tall, unarmed, glabrous or sparsely pubescent with simple or dendritic hairs on young growth, later glabrate. Leaves simple, alternate, elliptic to lanceolate, often 5-8 cm long, 1-1.5 cm wide, margins entire, often undulate, apex acute to acuminate, base cuneate and somewhat decurrent to petiole, petioles 5-12 mm long."

402	Allelopathic	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. 2015. Personal Communication	Unknown

403	Parasitic	n
	<b>Source(s)</b>	<b>Notes</b>
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Erect shrubs up to 1.5 m tall" [Solanaceae. No evidence]

404	Unpalatable to grazing animals	n
	<b>Source(s)</b>	<b>Notes</b>
	Fuller, T.C. & McClintock, E.M. 1986. Poisonous plants of California: Issue 53 of California natural history guides. University of California Press, Berkeley and Los Angeles, CA	[Eaten by sheep, but toxic] "Solanum pseudocapsicum. an escape from a neglected garden, covered about 160 sq ft of the corner of a Bermudagrass pasture near Pomona, Los Angeles County. In August 1958, five sheep died suddenly in this pasture. The Jerusalem Cherry plants were eaten by the sheep, but none of the plant was found in the one dead animal examined. Only a slight skin hemorrhage was noticed in these previously healthy sheep."

405	Toxic to animals	y
	<b>Source(s)</b>	<b>Notes</b>
	Quattrocchi, U.. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"Berries and leaves poisonous. This plant contains an alkaloid, solanocapsine, that is related to solanine. Experiments have shown that the chemical can cause death, although it is unlikely because oral absorption of the toxin is minimal. Solanocapsine is an alkaloid that is structurally similar to solanine. Oral absorption is minimal in animals. Leaves crushed and the juice applied on skin eruptions."

Qsn #	Question	Answer
	Pet Poison Helpline. 2015. Jerusalem Cherry. <a href="http://www.petpoisonhelpline.com/poison/jerusalem-cherry/">http://www.petpoisonhelpline.com/poison/jerusalem-cherry/</a> . [Accessed 17 Aug 2015]	"Poisonous to: Cats, Dogs Level of toxicity: Generally mild to moderate Common signs to watch for: Drooling, vomiting, diarrhea, ulceration, depression, seizures The Jerusalem Cherry ( <i>Solanum pseudocapsicum</i> ) contains beautiful red to yellow berries or fruit. All parts of this plant contain the toxin, solanine. This glycoalkaloid causes severe gastrointestinal irritation (e.g., drooling, vomiting, diarrhea, ulceration) when consumed and may also produce central nervous system signs (e.g., depression, seizures). Poison type: Plants Alternate names: Solanum, Solanum pseudocapsicum, winter cherry, natal cherry"

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	CABI. 2015. <i>Solanum pseudocapsicum</i> in: Invasive Species Compendium. Wallingford, UK: CAB International. <a href="http://www.cabi.org/isc">www.cabi.org/isc</a>	"Minor host of: <i>Bactrocera latifrons</i> ( <i>Solanum</i> fruit fly) Wild hosts <i>Aculops lycopersici</i> (tomato russet mite); <i>Ceratitis capitata</i> (Mediterranean fruit fly); <i>Puccinia substriata</i> var. <i>substriata</i> "
	Shoot Gardening. 2015. <i>Solanum pseudocapsicum</i> (Winter cherry). <a href="http://www.shootgardening.co.uk/plant/solanum-pseudocapsicum">http://www.shootgardening.co.uk/plant/solanum-pseudocapsicum</a> . [Accessed 17 Aug 2015]	"Specific pests: Aphids "

407	Causes allergies or is otherwise toxic to humans	y
	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	"Berries and leaves poisonous. This plant contains an alkaloid, solanocapsine, that is related to solanine. Experiments have shown that the chemical can cause death, although it is unlikely because oral absorption of the toxin is minimal. Solanocapsine is an alkaloid that is structurally similar to solanine. Oral absorption is minimal in animals. Leaves crushed and the juice applied on skin eruptions."
	Knight, A. 2007. A Guide to Poisonous House and Garden Plants. CRC Press, Boca Raton, FL	"Jerusalem cherries are common as potted houseplants, especially around the holiday season, because of their attractive red berries. The berries are attractive to young children who may pick and eat them. Household pets are potentially susceptible to the toxic berries when the plants are accessible to them." ... "Colic, vomiting, and diarrhea are the most prevalent signs of poisoning. In large doses the glycoalkaloids can cause depression, rapid heart rate, and respiratory difficulty. Dilated pupils, muscle tremors, and in coordination may also develop in severe poisoning."

408	Creates a fire hazard in natural ecosystems	
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[May add to fuel load, but unlikely to increase fire risk in habitats where fire is not already a significant threat due to presence of invasive grasses] "in Hawai'i naturalized in disturbed sites in mesic forest, grassy pastures, along seasonal streams, and in open or shaded woods"

Qsn #	Question	Answer
	Weber, E. 2003. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	No evidence

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"in open or shaded woods"
	Shoot Gardening. 2015. Solanum pseudocapsicum (Winter cherry). <a href="http://www.shootgardening.co.uk/plant/solanum-pseudocapsicum">http://www.shootgardening.co.uk/plant/solanum-pseudocapsicum</a> . [Accessed 17 Aug 2015]	"Light: Full Sun, Partial Shade"
	Weedbusters. 2015. Jerusalem Cherry. Solanum pseudocapsicum and Solanum diflorum. <a href="http://www.weedbusters.org.nz/weed-information/solanum-pseudocapsicum/59/">http://www.weedbusters.org.nz/weed-information/solanum-pseudocapsicum/59/</a> . [Accessed 17 Aug 2015]	"Produces many, well dispersed seeds and forms dense stands in shady spots. Tolerates shade, ..."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	
	Source(s)	Notes
	Backyard Gardener. 2015. Solanum pseudocapsicum. <a href="http://www.backyardgardener.com/plantname/pda_2502.html">http://www.backyardgardener.com/plantname/pda_2502.html</a> . [Accessed 17 Aug 2015]	"pH Range: 7 to 8 Soil Range: Some Sand to Some Clay"
	Dave's Garden. 2015. Jerusalem Cherry, Winter Cherry, Madeira Winter Cherry. Solanum pseudocapsicum. <a href="http://davesgarden.com/guides/pf/go/54393/">http://davesgarden.com/guides/pf/go/54393/</a> . [Accessed 17 Aug 2015]	"Soil pH requirements: 6.6 to 7.5 (neutral)"
	Shoot Gardening. 2015. Solanum pseudocapsicum (Winter cherry). <a href="http://www.shootgardening.co.uk/plant/solanum-pseudocapsicum">http://www.shootgardening.co.uk/plant/solanum-pseudocapsicum</a> . [Accessed 17 Aug 2015]	"Soil type: Chalky, Clay, Sandy Soil drainage: Moist but well-drained, Well-drained Soil pH: Alkaline, Neutral"

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Erect shrubs up to 1.5 m tall, unarmed, glabrous or sparsely pubescent with simple or dendritic hairs on young growth, later glabrate."

412	Forms dense thickets	y
	Source(s)	Notes

Qsn #	Question	Answer
	Weedbusters. 2015. Jerusalem Cherry. <i>Solanum pseudocapsicum</i> and <i>Solanum diflorum</i> . <a href="http://www.weedbusters.org.nz/weed-information/solanum-pseudocapsicum/59/">http://www.weedbusters.org.nz/weed-information/solanum-pseudocapsicum/59/</a> . [Accessed 17 Aug 2015]	"Can form dense stands in disturbed (especially grazed) forest and shrubland. Usually succeeded with competition for ground space."
	Weber, E. 2003. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	"Where invasive, it becomes abundant and forms dense patches that crowd out native plants and prevent the regeneration of shrubs and trees. "

501	Aquatic	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Terrestrial shrub] "Erect shrubs up to 1.5 m tall, unarmed..." ... "in disturbed sites in mesic forest, grassy pastures, along seasonal streams, and in open or shaded woods, 600-2,100 m"

502	Grass	n
	Source(s)	Notes
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: <a href="http://www.ars-grin.gov/">http://www.ars-grin.gov/</a> . [Accessed 14 Aug 2015]	"Family: Solanaceae subfamily: Solanoideae tribe: Solaneae"

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: <a href="http://www.ars-grin.gov/">http://www.ars-grin.gov/</a> . [Accessed 14 Aug 2015]	"Family: Solanaceae subfamily: Solanoideae tribe: Solaneae"

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Erect shrubs up to 1.5 m tall, unarmed"

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	No evidence. Broad native range and widely introduced & naturalized outside native range

602	Produces viable seed	y
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Queensland Government. 2011. Weeds of Australia - Madeira winter cherry - <i>Solanum pseudocapsicum</i> . <a href="http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Solanum_pseudocapsicum.htm">http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Solanum_pseudocapsicum.htm</a> . [Accessed 17 Aug 2015]	"This species reproduces mainly by seed, which are most often dispersed by birds and other animals that eat the fleshy fruit."

603	Hybridizes naturally	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. 2015. Personal Communication	Unknown. Interspecific hybridization documented in genus

604	Self-compatible or apomictic	Y
	<b>Source(s)</b>	<b>Notes</b>
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Berries 1-2 developing per cyme, bright orangish red, succulent, globose, erect on pedicels, 1-1.5 cm in diameter, calyx somewhat enlarged. Self-compatible; [2n = 24.]"

605	Requires specialist pollinators	n
	<b>Source(s)</b>	<b>Notes</b>
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Flowers perfect, actinomorphic, solitary or few on short common peduncles 5- 10 mm long, often leaf-opposed, pedicels ca. 1 cm long; calyx tubular, 2-3 mm long, the lobes long-triangular, 2-3 mm long; corolla white, rotate-stellate, ca. 1 cm long; stamens inserted near base of corolla tube; filaments ca. 0.5 mm long, glabrous; anthers oblong, ca. 2 mm long, opening by apical slits; ovary globose; style 1, erect, exceeding anthers; stigma terminal."
	Freitas, L., & Sazima, M. (2006). Pollination biology in a tropical high-altitude grassland in Brazil: interactions at the community level. <i>Annals of the Missouri Botanical Garden</i> , 93(3): 465-516	Pollinated by Halictidae, Augochlorini (sweat bees)

606	Reproduction by vegetative fragmentation	n
	<b>Source(s)</b>	<b>Notes</b>
	Murray, B. R., & Phillips, M. L. (2010). Investment in seed dispersal structures is linked to invasiveness in exotic plant species of south eastern Australia. <i>Biological Invasions</i> , 12 (7): 2265-2275	"Table 1 The dataset of naturalized exotic plant species of Royal National Park (south-eastern Australia) and attribute values for invasion status" ... "capacity for vegetative spread (1 = no observed capacity" [ <i>Solanum pseudocapsicum</i> reported to have no observed capacity for vegetative spread]

Qsn #	Question	Answer
607	Minimum generative time (years)	2
	Source(s)	Notes
	Shoot Gardening. 2015. <i>Solanum pseudocapsicum</i> (Winter cherry). <a href="http://www.shootgardening.co.uk/plant/solanum-pseudocapsicum">http://www.shootgardening.co.uk/plant/solanum-pseudocapsicum</a> . [Accessed 17 Aug 2015]	"2-5 years To maturity"

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y
	Source(s)	Notes
	Michael, P. (ed.). 2012. The Master Weed Wackers Manual. A compilation of the most common weeds found on Port Macquarie Landcare sites. Port Macquarie Landcare Group, Inc., Port Macquarie, NSW	"Readily dispersed by birds attracted to the colourful fruit. As seed can often survive composting temperatures (55+ degC), it can be spread in this material or dumped garden waste."
	Weedbusters. 2015. Jerusalem Cherry. <i>Solanum pseudocapsicum</i> and <i>Solanum diflorum</i> . <a href="http://www.weedbusters.org.nz/weed-information/solanum-pseudocapsicum/59/">http://www.weedbusters.org.nz/weed-information/solanum-pseudocapsicum/59/</a> . [Accessed 17 Aug 2015]	"Seeds are spread by birds and water and soil movement, and in dumped vegetation. Common seed sources include grazed bush remnants, hedgerows, and many other shady places."

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Queensland Government. 2011. Weeds of Australia - Madeira winter cherry - <i>Solanum pseudocapsicum</i> . <a href="http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Solanum_pseudocapsicum.htm">http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Solanum_pseudocapsicum.htm</a> . [Accessed 17 Aug 2015]	"Madeira winter cherry ( <i>Solanum pseudocapsicum</i> ) is sometimes cultivated as a garden ornamental."

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Weedbusters. 2015. Jerusalem Cherry. <i>Solanum pseudocapsicum</i> and <i>Solanum diflorum</i> . <a href="http://www.weedbusters.org.nz/weed-information/solanum-pseudocapsicum/59/">http://www.weedbusters.org.nz/weed-information/solanum-pseudocapsicum/59/</a> . [Accessed 17 Aug 2015]	"Seeds are spread by birds and water and soil movement, and in dumped vegetation. Common seed sources include grazed bush remnants, hedgerows, and many other shady places."
	Queensland Government. 2011. Weeds of Australia - Madeira winter cherry - <i>Solanum pseudocapsicum</i> . <a href="http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Solanum_pseudocapsicum.htm">http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Solanum_pseudocapsicum.htm</a> . [Accessed 17 Aug 2015]	"This species reproduces mainly by seed, which are most often dispersed by birds and other animals that eat the fleshy fruit."

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes

Qsn #	Question	Answer
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[No adaptations for wind dispersal] "Berries 1-2 developing per cyme, bright orangish red, succulent, globose, erect on pedicels, 1-1.5 cm in diameter, calyx somewhat enlarged."

705	Propagules water dispersed	
	Source(s)	Notes
	Weedbusters. 2015. Jerusalem Cherry. <i>Solanum pseudocapsicum</i> and <i>Solanum diflorum</i> . <a href="http://www.weedbusters.org.nz/weed-information/solanum-pseudocapsicum/59/">http://www.weedbusters.org.nz/weed-information/solanum-pseudocapsicum/59/</a> . [Accessed 17 Aug 2015]	"Seeds are spread by birds and water and soil movement, and in dumped vegetation. Common seed sources include grazed bush remnants, hedgerows, and many other shady places."
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Distribution along streams could aid in secondary dispersal by water] "naturalized in disturbed sites in mesic forest, grassy pastures, along seasonal streams"

706	Propagules bird dispersed	y
	Source(s)	Notes
	Buchanan, R. A. (1989). Pied currawongs ( <i>Strepera graculina</i> ): their diet and role in weed dispersal in suburban Sydney, New South Wales. <i>Proceedings of the Linnean Society of New South Wales</i> 111(1-4): 241-255	"In this dietary study of an abundant population of pied currawongs ( <i>S. graculina</i> ), 1009 regurgitated pellets collected over 25 months, were analysed. The percentage of pellets containing plant parts, mostly seeds of fleshy fruit, was high throughout the year (79-98%). The fruit of introduced plants was present in 45-91% of pellets containing plant material. The seeds of 46 species, of which 36 were introduced, were identified in their pellets. Fruits of the family Oleaceae, including the 3 introduced species, <i>Ligustrum sinense</i> , <i>Ligustrum lucidum</i> and <i>Olea africana</i> were the most significant part of the currawong diet for 3 months of the year, when at least one of these species was present in 54-74% of the pellets analysed. Other major plant species in the diet included the introduced <i>Pyracantha angustifolia</i> , <i>Morus nigra</i> , <i>Ochna atropurpurea</i> , <i>Solanum pseudocapsicum</i> , and the native <i>Elaeocarpus reticulatus</i> ."
	Guix, J. C. (2007). The role of alien plants in the composition of fruit eating bird assemblages in Brazilian urban ecosystems. <i>Orsis</i> 22: 087-104	"Many of the feeding bouts in the study areas came from thrushes ( <i>Turdus</i> spp., Turdidae). Although the thrush species found in urban areas are relatively small (40-83 g) and short billed they have wide gapes and can ingest relatively large fleshy fruits whole, such as those of <i>Syagrus romanzoffiana</i> , <i>Livistona australis</i> (Arecaceae), <i>Eugenia uniflora</i> (Myrtaceae) <i>Coffea arabica</i> (Rubiaceae), and <i>Solanum pseudocapsicum</i> (Solanaceae)."
	Queensland Government. 2011. Weeds of Australia - Madeira winter cherry - <i>Solanum pseudocapsicum</i> . <a href="http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Solanum_pseudocapsicum.htm">http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Solanum_pseudocapsicum.htm</a> . [Accessed 17 Aug 2015]	"This species reproduces mainly by seed, which are most often dispersed by birds and other animals that eat the fleshy fruit."
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Fleshy-fruited] "Berries 1-2 developing per cyme, bright orangish red, succulent, globose, erect on pedicels, 1-1.5 cm in diameter, calyx somewhat enlarged."

707	Propagules dispersed by other animals (externally)	n
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Queensland Government. 2011. Weeds of Australia - Madeira winter cherry - <i>Solanum pseudocapsicum</i> . <a href="http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Solanum_pseudocapsicum.htm">http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Solanum_pseudocapsicum.htm</a> . [Accessed 17 Aug 2015]	[Dispersed internally] "This species reproduces mainly by seed, which are most often dispersed by birds and other animals that eat the fleshy fruit."

708	Propagules survive passage through the gut	Y
	<b>Source(s)</b>	<b>Notes</b>
	Santos, E. F., Setz, E. Z., & Gobbi, N. (2003). Diet of the maned wolf ( <i>Chrysocyon brachyurus</i> ) and its role in seed dispersal on a cattle ranch in Brazil. <i>Journal of Zoology</i> , 260(02): 203-208	"Seeds representing at least nine plant species (mean 1.07±0.28 species/sample) were found in 135 (90%) scats." ... "Other fruit species in the diet were bell peppers <i>Capsicum annuum</i> , <i>Nicandra physaloides</i> , <i>Solanum aculeatissimum</i> , <i>Solanum erianthum</i> , <i>Solanum pseudocapsicum</i> (all Solanaceae), coffee <i>Coffea arabica</i> (Rubiaceae) and papaya <i>Carica papaya</i> (Caricaceae)."
	D'Arcy, W. G. (1974). <i>Solanum</i> and its close relatives in Florida. <i>Annals of the Missouri Botanical Garden</i> , 61(3): 819-867	"The only cases for which the writer can personally vouch of birds eating <i>Solanum</i> fruits are the frequent feeding on berries of sect. <i>Solanum</i> by mockingbirds, which sometimes entered the Gainesville greenhouse, and greedy feeding on fruits of <i>Solanum pseudocapsicum</i> by chickens at an upland Panama farmstead"

801	Prolific seed production (>1000/m2)	
	<b>Source(s)</b>	<b>Notes</b>
	Symon, D. E. (1981). A revision of the genus <i>Solanum</i> in Australia. <i>Journal of the Adelaide Botanic Gardens</i> , 4: 1-367	"Seeds about 50 per fruit, flat, 3 mm diam., pale buff or yellow, with thickened margin slightly deeper in colour, surface minutely granular."
	Queensland Government. 2011. Weeds of Australia - Madeira winter cherry - <i>Solanum pseudocapsicum</i> . <a href="http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Solanum_pseudocapsicum.htm">http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Solanum_pseudocapsicum.htm</a> . [Accessed 17 Aug 2015]	"The fruit is a rounded berry (10-15 mm across) and turns from green to yellow and eventually bright orange-red as it matures. Each fruit contains numerous white or pale yellow seeds (3-4 mm long)."
	Weedbusters. 2015. Jerusalem Cherry. <i>Solanum pseudocapsicum</i> and <i>Solanum diflorum</i> . <a href="http://www.weedbusters.org.nz/weed-information/solanum_pseudocapsicum/59/">http://www.weedbusters.org.nz/weed-information/solanum_pseudocapsicum/59/</a> . [Accessed 17 Aug 2015]	[Densities unspecified] "Reseeds densely in bared sites."

Qsn #	Question	Answer
802	Evidence that a persistent propagule bank is formed (>1 yr)	y
	Source(s)	Notes
	Michael, P. (ed.). 2012. The Master Weed Wackers Manual. A compilation of the most common weeds found on Port Macquarie Landcare sites. Port Macquarie Landcare Group, Inc., Port Macquarie, NSW	"Capable of germinating in partial shade, but well suited to forest edges and ecotones where seed is often deposited by birds. As for many Solanaceae plants, the seed bank is persistent for several years in the soil and can withstand relatively high temperatures. Readily dispersed by birds attracted to the colourful fruit."

803	Well controlled by herbicides	y
	Source(s)	Notes
	Michael, P. (ed.). 2012. The Master Weed Wackers Manual. A compilation of the most common weeds found on Port Macquarie Landcare sites. Port Macquarie Landcare Group, Inc., Port Macquarie, NSW	"CHEMICAL: For spot-spraying or dense infestations use glyphosate (eg RoundUp Biactive) at 10mL L-1. Cut-paste with undiluted glyphosate close to ground level."
	Loh, R. K., Tunison, T., Zimmer, C., Mattos, R., & Benitez, D (2014). A review of invasive plant management in Special Ecological Areas, Hawai'i Volcanoes National Park, 1984-2007. Technical Report 187. Pacific Cooperative Studies Unit, University of Hawaii, Honolulu, HI	"Table 2. Herbicide Control Methods for Target Invasive Weeds" [Solanum pseudocapsicum - Herbicide Control Method = 1% Garlon 4 Foliar]
	Weedbusters. 2015. Jerusalem Cherry. Solanum pseudocapsicum and Solanum diflorum. <a href="http://www.weedbusters.org.nz/weed-information/solanum-pseudocapsicum/59/">http://www.weedbusters.org.nz/weed-information/solanum-pseudocapsicum/59/</a> . [Accessed 17 Aug 2015]	"What can I do to get rid of it? Hand pull all but the largest plants (all year round). Leave on site to rot down. 2. Weed wipe (spring-autumn): triclopyr 600 EC or Tordon Gold (333ml /L). 3. Spray small plants (spring-autumn): 2,4-D ester (70ml/10L). 4. Spray plants over 30 cm tall (spring-autumn): glyphosate (10ml/L) or Tordon Gold (600ml/100L)."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	Source(s)	Notes
	Shoot Gardening. 2015. Solanum pseudocapsicum (Winter cherry). <a href="http://www.shootgardening.co.uk/plant/solanum-pseudocapsicum">http://www.shootgardening.co.uk/plant/solanum-pseudocapsicum</a> . [Accessed 17 Aug 2015]	"Pruning: Can cut back by two thirds in spring"
	Weedbusters. 2015. Jerusalem Cherry. Solanum pseudocapsicum and Solanum diflorum. <a href="http://www.weedbusters.org.nz/weed-information/solanum-pseudocapsicum/59/">http://www.weedbusters.org.nz/weed-information/solanum-pseudocapsicum/59/</a> . [Accessed 17 Aug 2015]	"Tolerates shade, damage and treading around roots (poisonous, not grazed), wet to moderate dry conditions and hot temperatures but is intolerant of frost, competition for space, high winds, and poor soils." ... "Cut stumps occasionally resprout."

Qsn #	Question	Answer
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	<b>Source(s)</b>	<b>Notes</b>
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Unknown] "in Hawai'i naturalized in disturbed sites in mesic forest, grassy pastures, along seasonal streams, and in open or shaded woods, 600-2,100 m, on O'ahu, Moloka'i, Maui, and Hawai'i."

**Summary of Risk Traits:**

## High Risk / Undesirable Traits

- Elevation range exceeds 1000 m, demonstrating environmental versatility
- Thrives in tropical climates
- Widely naturalized, including Oahu, Molokai, Maui, and Hawaii
- Environmental weed, can exclude native species
- Other *Solanum* species are invasive
- Toxic to animals & people
- Shade tolerant
- Forms dense stands
- Reproduces by seed
- Self-compatible
- Seeds dispersed by birds & both accidentally & intentionally by people
- Seeds may form a persistent seed bank
- Able to resprout after cutting or pruning

## Low Risk Traits

- Unarmed (no spines, thorns or burrs)
- Ornamental
- Not reported to spread vegetatively
- Herbicides may provide effective control