

**Family:** *Solanaceae*

**Taxon:** *Solanum betaceum*

**Synonym:** *Cyphomandra betacea* (Cav.) Sendtn.  
*Cyphomandra crassifolia* Kuntze  
*Solanum crassifolium* Ortega

**Common Name:** Tree tomato  
 Arbre à tomates  
 Tomate-de-árvore  
 Tamarillo  
 Tomate de árbol

**Questionnaire :** current 20090513      **Assessor:** Chuck Chimera      **Designation:** H(HPWRA)  
**Status:** Assessor Approved      **Data Entry Person:** Chuck Chimera      **WRA Score** 7

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)	Low
203	Broad climate suitability (environmental versatility)	y=1, n=0	n
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	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)	y
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	n
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	y
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic	y=1, n=0	n
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals	y=1, n=-1	
405	Toxic to animals	y=1, n=0	
406	Host for recognized pests and pathogens	y=1, n=0	
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	
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	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	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	y=1, n=-1	
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	
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	n
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	n
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	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)	y=-1, n=1	

Designation: H(HPWRA)

WRA Score 7

## Supporting Data:

101	1987. Morton, J.F.. Fruits of warm climates - Tree Tomato ( <i>Cyphomandra betacea</i> ). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html">http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html</a>	[Is the species highly domesticated? No] "There are apparently no named cultivars, but there are local preferences according to fruit color. Red fruits are chosen for the fresh fruit markets because of their appealing color. The dark-red strain (called "black") now leading in commercial plantings in New Zealand was obtained by selection around 1920 as a variation from the yellow and purple types grown up to that time. It was propagated and reselection thereafter resulted in this large, higher quality, red variety. Yellow fruits are considered best for preserving because of their superior flavor."
101	1994. Bohs, L.. <i>Cyphomandra</i> (Solanaceae). <i>Flora Neotropica</i> . 63: 1-175.	[Is the species highly domesticated? No] "Cyphomandra betacea also has the derived state of self compatibility, which may be related to its cultivated status." [Domestication may have resulted in the ability to self-fertilize]
102	2012. WRA Specialist. Personal Communication.	NA
103	2012. WRA Specialist. Personal Communication.	NA
201	1987. Morton, J.F.. Fruits of warm climates - Tree Tomato ( <i>Cyphomandra betacea</i> ). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html">http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html</a>	[Species suited to tropical or subtropical climate(s) 2-High] "The tree tomato is not tropical but subtropical. It flourishes between 5,000 and 10,000 ft (1,525-3,050 m) in Ecuador; between 1,000 and 3,000 ft (305 915 m) in Puerto Rico; 1,000 to 7,500 ft (305 2,288 m) in India. In Haiti it grows and fruits to perfection at 6,000 ft (1,830 m). In cooler climates, it succeeds at lower elevations. It does best where the temperature remains above 50° F (10° C). Frost at 28° F (-2.2° C) kills the small branches and foliage of mature trees but not the largest branches and main stem. The tree will recover if such frosts are not prolonged or frequent. However, seedlings and cuttings are readily killed by frost during their first year."
202	1994. Bohs, L.. <i>Cyphomandra</i> (Solanaceae). <i>Flora Neotropica</i> . 63: 1-175.	[Quality of climate match data 0-Low] "The natural range of <i>C. betacea</i> is unclear. On the map of Fig. 11 all the known localities of <i>C. betacea</i> in the Neotropics are included, and cultivated individuals probably account for many of the outlying points."
203	1987. Morton, J.F.. Fruits of warm climates - Tree Tomato ( <i>Cyphomandra betacea</i> ). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html">http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html</a>	[Broad climate suitability (environmental versatility)? No] "The tree tomato is not tropical but subtropical. It flourishes between 5,000 and 10,000 ft (1,525-3,050 m) in Ecuador; between 1,000 and 3,000 ft (305 915 m) in Puerto Rico; 1,000 to 7,500 ft (305 2,288 m) in India. In Haiti it grows and fruits to perfection at 6,000 ft (1,830 m). In cooler climates, it succeeds at lower elevations. It does best where the temperature remains above 50° F (10° C). Frost at 28° F (-2.2° C) kills the small branches and foliage of mature trees but not the largest branches and main stem. The tree will recover if such frosts are not prolonged or frequent. However, seedlings and cuttings are readily killed by frost during their first year." [Although elevation range exceeds 1000 m, it is mostly suited to higher elevations]
203	1996. Bajaj, Y.P.S.. <i>Biotechnology in agriculture and forestry: Trees IV</i> . Springer-Verlag, Berlin, Heidelberg, New York	[Broad climate suitability (environmental versatility)? No] "Tamarillos do not withstand very low temperatures (frost may kill the leaves and tender growths - Slack 1976), or the very high tropical heat (Morris 1887; Bois 1927). They do best in subtropical conditions or in tropical regions at altitudes between 700 and 2000 m (Boies 1927; Fouque 1973)."
203	2012. World Agroforestry Centre. <i>AgroForestry Tree Database - Cyphomandra betacea</i> . PROSEA, <a href="http://www.worldagroforestrycentre.org/sea/products/afdbases/af/asp/SpeciesInfo.asp?SpID=639">http://www.worldagroforestrycentre.org/sea/products/afdbases/af/asp/SpeciesInfo.asp?SpID=639</a>	[Broad climate suitability (environmental versatility)? No] "Altitude: 1 000-3 000 m, Mean annual temperature: 15-21 deg. C Soil type: Grow best on well drained soils rich in organic matter and ample moisture. They cannot withstand waterlogging even for a period of a few days." [Elevation range exceeds 1000 m]
204	1987. Morton, J.F.. Fruits of warm climates - Tree Tomato ( <i>Cyphomandra betacea</i> ). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html">http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html</a>	[Native or naturalized in regions with tropical or subtropical climates? Yes] "The tree tomato is not tropical but subtropical. It flourishes between 5,000 and 10,000 ft (1,525-3,050 m) in Ecuador; between 1,000 and 3,000 ft (305 915 m) in Puerto Rico; 1,000 to 7,500 ft (305 2,288 m) in India. In Haiti it grows and fruits to perfection at 6,000 ft (1,830 m). In cooler climates, it succeeds at lower elevations. It does best where the temperature remains above 50° F (10° C). Frost at 28° F (-2.2° C) kills the small branches and foliage of mature trees but not the largest branches and main stem. The tree will recover if such frosts are not prolonged or frequent. However, seedlings and cuttings are readily killed by frost during their first year."

205	1987. Morton, J.F.. Fruits of warm climates - Tree Tomato ( <i>Cyphomandra betacea</i> ). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html">http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html</a>	[Does the species have a history of repeated introductions outside its natural range? Yes] "It must have been carried at an early date to East Africa, Asia and the East Indies, as it is well established in the Nilgiri heights and the hills of Assam in southern India, and in the mountains of Malaya, and was popular in Ceylon and the Dutch East Indies before 1903. It has been grown in Queensland, Australia, in home gardens, for many years and is a practical crop in the highlands of the Australian part of New Guinea. D. Hay & Sons, nurserymen, introduced the tree tomato into New Zealand in 1891 and commercial growing on a small scale began about 1920. Shortages of tropical fruits in World War II justified an increased level of production. A promotional campaign was launched in 1961; window banners and 100,000 recipe leaflets were distributed. This small industry prospered until 1967 when annual production reached a peak of 2,000 tons. There was a heavy loss of trees at Kerikeri in 1968. Replanting took place there and at the Bay of Plenty and cultivation of this crop continues to expand. In 1970, there were 209,110 trees on 476 acres (130 ha) in New Zealand. Shipment of the fresh fruits to Australia has not been very successful and the surplus crop is being delivered to processors for the making of preserves. The United States Department of Agriculture received seeds from Argentina in 1913; from Sumatra and Ceylon in 1926. The plant was fruiting at the United States Department of Agriculture's Plant Introduction Station at Chico, California, in 1915. It is still grown casually in California and occasionally in Florida. It is frequently advertised and sold throughout the United States for growing indoors in pots as a curiosity. It fruits satisfactorily in northern greenhouses."
301	1988. Webb, C. J./Sykes, W.R./Garnock-Jones, P.J.. Flora of New Zealand, Volume IV: Naturalised pteridophytes, gymnosperms, dicotyledons. Botany Division, DSIR, Christchurch, New Zealand <a href="http://FloraSeries.LandcareResearch.co.nz">http://FloraSeries.LandcareResearch.co.nz</a>	[Naturalized beyond native range? Yes] "Waste places, rubbish dumps, forest clearings or margins near dwellings."
301	1994. Bohs, L.. <i>Cyphomandra</i> (Solanaceae). Flora Neotropica. 63: 1-175.	[Naturalized beyond native range? Potentially] "...collections from the Galapagos and Caribbean (with the exception of Tobago) represent collections of <i>C. betacea</i> . These may be from cultivated or naturalized plants."
301	2003. Nyoka, B.I.. Biosecurity in forestry: a case study on the status of invasive forest trees species in Southern Africa. Forest Biosecurity Working Paper FBS/1E. Forestry Department. FAO, Rome <a href="http://www.fao.org/DOCREP/005/AC846E/ac846e00.htm#Contents">http://www.fao.org/DOCREP/005/AC846E/ac846e00.htm#Contents</a>	[Naturalized beyond native range? Yes] "The other localized invasive tree species in the eastern highlands are <i>A. podalyriifolia</i> in the La Rochelle botanical gardens, <i>Prunus cerasoides</i> in the Troutbeck area of Nyanga, and <i>Albizia procera</i> and <i>Cyphomandra betacea</i> in Chipinge."
301	2010. Wu, S.-H./Yang, T.Y.A./Teng, Y.-C./Chang, C.-Y./Yang, K.-C./Hsieh, C.-F.. Insights of the Latest Naturalized Flora of Taiwan: Change in the Past Eight Years. <i>Taiwania</i> . 55(2): 139-159.	[Naturalized beyond native range? Yes] "Appendix 1. List of naturalized species of Taiwan" [Includes <i>Cyphomandra betacea</i> ]
301	2012. CSIRO. Australian Tropical Rainforest Plants [online database] - <i>Solanum betaceum</i> . <a href="http://keys.trin.org.au:8080/key-server/data/0e0f0504-0103-430d-8004-060d07080d04/media/Html/taxon/Solanum_betaceum.htm">http://keys.trin.org.au:8080/key-server/data/0e0f0504-0103-430d-8004-060d07080d04/media/Html/taxon/Solanum_betaceum.htm</a>	[Naturalized beyond native range? Yes] "An introduced species originally from South America now naturalized in most parts of the higher rainfall parts of eastern coastal Queensland and south-eastern New South Wales. Altitudinal range in NEQ from 700-800 m (?) Grows in disturbed areas of upland rain forest, particularly on basalt."
301	2012. PlantNET. New South Wales flora online - <i>Solanum betaceum</i> Cav.. Royal Botanic Gardens & Domain Trust., Sydney <a href="http://plantnet.rbg Syd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&amp;lvl=sp&amp;name=Solanum~betaceum">http://plantnet.rbg Syd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&amp;lvl=sp&amp;name=Solanum~betaceum</a>	[Naturalized beyond native range? Yes] "Distribution and occurrence: Cultivated for its edible fruits, occasionally naturalized in coastal areas; north from Tuross Heads area."
301	2012. Wagner, W.L./Herbst, D.R./Khan, N./Flynn, T.. Hawaiian Vascular Plant Updates: A Supplement to the Manual of the Flowering Plants of Hawai'i & Hawai'i's Ferns & Fern Allies. <a href="http://botany.si.edu/pacificislandbiodiversity/hawaiianflora/supplement.htm">http://botany.si.edu/pacificislandbiodiversity/hawaiianflora/supplement.htm</a>	[Naturalized beyond native range? No evidence from Hawaiian Islands]

302	2006. Sullivan, J.J./Williams, P.A./Timmins, S.M.. Effects of Pinus radiata plantations on environmental weed invasion into adjacent native forest reserves. Science & Technical Publishing - Department of Conservation, Wellington, NZ	[Garden/amenity/disturbance weed? Yes] "DOC weeds This included weeds controlled by DOC in forest and scrub ecosystems that are listed as weeds in the DOC National Weeds Database3. Two other species were also recorded in this group—Cyphomandra betacea and Physalis peruviana. Although these two species are not actually listed by DOC as weeds, they illustrate the potential of garden escapes to invade native forests. These are termed 'weeds' hereafter. (Note that a more liberal interpretation of 'weed' may be used by other authors quoted.)" [A "weedy" tree of unspecified negative impacts]
302	2010. invasives.org. Invasive species in South Africa - Solanum betaceum. <a href="http://invasives.org.za/flora-listed-invasives/solanum-betaceum.html">http://invasives.org.za/flora-listed-invasives/solanum-betaceum.html</a>	[Garden/amenity/disturbance weed? Yes] "Category : 3 in KwaZulu-Natal, Mpumalanga, Limpopo and Eastern Cape" [Category 3: Declared invader (ornamentals), no new planting, trade or propagation is permitted]
303	2007. Randall, R.P.. Global Compendium of Weeds - Cyphomandra betacea [Online Database]. <a href="http://www.hear.org/gcw/species/cyphomandra_betacea/">http://www.hear.org/gcw/species/cyphomandra_betacea/</a>	[Agricultural/forestry/horticultural weed? Possibly] Listed as an agricultural weed of South Africa, but no evidence of impacts to agriculture was found.
304	2006. Sullivan, J.J./Williams, P.A./Timmins, S.M.. Effects of Pinus radiata plantations on environmental weed invasion into adjacent native forest reserves. Science & Technical Publishing - Department of Conservation, Wellington, NZ	[Environmental weed? No, but starting to appear in natural areas] "DOC weeds This included weeds controlled by DOC in forest and scrub ecosystems that are listed as weeds in the DOC National Weeds Database3. Two other species were also recorded in this group—Cyphomandra betacea and Physalis peruviana. Although these two species are not actually listed by DOC as weeds, they illustrate the potential of garden escapes to invade native forests. These are termed 'weeds' hereafter. (Note that a more liberal interpretation of 'weed' may be used by other authors quoted.)"
305	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	[Congeneric weed? Yes] Solanum laxum, Solanum linnaeanum, Solanum mauritanium, Solanum nigrum, Solanum pseudocapsicum, Solanum tampicense, Solanum viarum listed as weeds of natural areas [As tree tomato is now currently classified as Solanum betaceum]
401	1987. Morton, J.F.. Fruits of warm climates - Tree Tomato (Cyphomandra betacea). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html">http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html</a>	[Produces spines, thorns or burrs? No] "The plant is a small, half-woody, attractive, fast-growing, brittle tree; shallow rooted; reaching 10 to 18 ft (3-5.5 m) in height; rarely as much as 25 ft (7.5 m). The leaves are muskily odorous, evergreen, alternate, more or less heart-shaped at the base, ovate, pointed at the apex, 4 to 13 1/2 in (10-35 cm) long and 1 1/2 to 4 3/4 in (4-12 cm) broad, thin, softly hairy, with conspicuous coarse vein."
402	2012. World Agroforestry Centre. AgroForestry Tree Database - Cyphomandra betacea. PROSEA, <a href="http://www.worldagroforestrycentre.org/sea/products/afdbases/af/asp/SpeciesInfo.asp?SplD=639">http://www.worldagroforestrycentre.org/sea/products/afdbases/af/asp/SpeciesInfo.asp?SplD=639</a>	[Allelopathic? No evidence] "Ornamental: C. betacea is frequently grown as a curiosity in gardens in the temperate regions of North America. It is a common sight in homegardens of Latin America. Intercropping: The species can be grown with crops such as coffee. Green manure or cover crops of grass and clover can be grown between rows. New Zealand growers often plant C. betacea as an intercrop in young citrus orchards."
403	1987. Morton, J.F.. Fruits of warm climates - Tree Tomato (Cyphomandra betacea). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html">http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html</a>	[Parasitic? No] "The plant is a small, half-woody, attractive, fast-growing, brittle tree; shallow rooted; reaching 10 to 18 ft (3-5.5 m) in height; rarely as much as 25 ft (7.5 m)." Not parasitic. Solanaceae]
404	2012. WRA Specialist. Personal Communication.	[Unpalatable to grazing animals? Unknown]
405	2008. Wagstaff, D.J.. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	[Toxic to animals? Unknown] No evidence
405	2012. Plants for a Future Database. Cyphomandra betacea. <a href="http://www.pfaf.org/user/plant.aspx?latinname=Cyphomandra+betacea">http://www.pfaf.org/user/plant.aspx?latinname=Cyphomandra+betacea</a>	[Toxic to animals? Possibly] "The unripe fruit is slightly toxic"
405	2012. Specialized Information Services, U.S. National Library of Medicine. TOXNET toxicology data network [online database]. National Institutes of Health, <a href="http://toxnet.nlm.nih.gov/">http://toxnet.nlm.nih.gov/</a>	[Toxic to animals? Unknown] No evidence

406	1987. Morton, J.F.. Fruits of warm climates - Tree Tomato ( <i>Cyphomandra betacea</i> ). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html">http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html</a>	[Host for recognized pests and pathogens? No] "The tree tomato is generally regarded as fairly pest-resistant. A looper caterpillar makes large holes in the leaves of young plants in the nursery but causes little damage to trees in the field. Occasionally the plants are attacked by the green aphid. In South America and the Caribbean, the fruits are subject to attack by fruit flies— <i>Anastrepha</i> sp. and <i>Carpolonchaea pendula</i> (syn. <i>Silba pendula</i> ). In Colombia, the tree tomato has been found to be the preferred host of the tree tomato worm ( <i>Neoleucinodes</i> sp.) which infests also the tomato and the eggplant. The larvae feed on the fruits and cause heavy losses. Rigorous spraying and sanitary measures are required to reduce losses and means of biological control are being sought. The principal disease is powdery mildew (both <i>Erysiphe</i> sp. and <i>Oidium</i> sp.), which may cause serious defoliation if not controlled. Minor problems include <i>Sclerotinia</i> disease ( <i>Sclerotinia sclerotiorum</i> ), the black lesions of which girdle stems and cause terminal wilting; and <i>Ascochyta</i> disease ( <i>Ascochyta</i> sp.) which is evidenced by small, round, black, dead areas on leaves, especially mature leaves. Tree tomato mosaic virus causes pale mottling on leaves and sometimes on the fruits which has not been considered a serious disadvantage. Another virus disorder, called "bootlace virus", distorts the leaf, especially on young plants, reducing it to little more than the midrib. Affected plants are pulled up and destroyed. The tree tomato is noted for its resistance to tobacco mosaic virus, though it is susceptible to cucumber mosaic virus and potato virus. Die-back, of unknown origin, at times is lethal to the flowers, fruit cluster, twigs and new shoots. A strain of Arabis mosaic virus (which, in combination with two other unidentified viruses, causes sunken necrotic rings on the fruit surface) was reported in two plantations in the TePuke-Tauranga area of New Zealand in 1971, together with the identification of its vector, the nematode <i>Xiphinema diversicaudatum</i> ."
406	2007. Love, K./Bowen, R./Fleming, K.. Twelve Fruits With Potential Value-Added and Culinary Uses. CTAHR, UH Manoa, Honolulu, HI <a href="http://www.ctahr.hawaii.edu/oc/freepubs/pdf/12fruits.pdf">http://www.ctahr.hawaii.edu/oc/freepubs/pdf/12fruits.pdf</a>	[Host for recognized pests and pathogens? Possibly] "The tree tomato is susceptible to a number of problems, which can be controlled with proper care. Fruit flies will attempt to lay eggs in the fruit. The tough skin offers protection, but this makes the fruit unattractive for marketing as fresh fruit. Use of strategies recommended by the Hawai'i Area-Wide Fruit Fly Pest Management Program (HAW FLYPM) can be very effective in preventing damage to fruit. The most common problem, powdery mildew ( <i>Oidium</i> sp.), can be addressed with applications of commercial insecticidal soaps and neem oil sprays. Root knot nematodes ( <i>Meloidogyne</i> sp.), root rot, crown rot ( <i>Phytophthora</i> sp.), and wilt from <i>Pseudomonas solanacearum</i> also affect the plant. Good cultural practices should help to stave off these problems."
407	2008. Wagstaff, D.J.. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	[Causes allergies or is otherwise toxic to humans? Unknown] No evidence
407	2012. Dave's Gardern. PlantFiles: Tree Tomato, Tamarillo - <i>Cyphomandra betacea</i> . <a href="http://davesgarden.com/guides/pf/go/2730/">http://davesgarden.com/guides/pf/go/2730/</a>	[Causes allergies or is otherwise toxic to humans? Possibly] "Parts of plant are poisonous if ingested Handling plant may cause skin irritation or allergic reaction Pollen may cause allergic reaction"
407	2012. Plants for a Future Database. <i>Cyphomandra betacea</i> . <a href="http://www.pfaf.org/user/plant.aspx?latinname=Cyphomandra+betacea">http://www.pfaf.org/user/plant.aspx?latinname=Cyphomandra+betacea</a>	[Causes allergies or is otherwise toxic to humans? Possibly] "The unripe fruit is slightly toxic"
407	2012. Specialized Information Services, U.S. National Library of Medicine. TOXNET toxicology data network [online database]. National Institutes of Health, <a href="http://toxnet.nlm.nih.gov/">http://toxnet.nlm.nih.gov/</a>	[Causes allergies or is otherwise toxic to humans? Unknown] No evidence
408	2000. Country Fire Service. Community Fire Safe: Fire Retardant Plants. Wildfire Fact Sheet No 16. Country Fire Service, Adelaide, SA <a href="http://www.cfs.sa.gov.au/public/download.jsp?id=1949">www.cfs.sa.gov.au/public/download.jsp?id=1949</a>	[Creates a fire hazard in natural ecosystems? No] "Introduced trees and shrubs that are hard to burn:" [Includes <i>Cyphomandra betacea</i> ]
408	2012. World Agroforestry Centre. AgroForestry Tree Database - <i>Cyphomandra betacea</i> . PROSEA, <a href="http://www.worldagroforestrycentre.org/sea/products/afdbases/af/asp/SpeciesInfo.asp?SpID=639">http://www.worldagroforestrycentre.org/sea/products/afdbases/af/asp/SpeciesInfo.asp?SpID=639</a>	[Creates a fire hazard in natural ecosystems? No] No evidence
409	2005. Bean, A.R. <i>Solanum</i> species of Eastern Australia. Version: 8th October 2006. <a href="http://delta-intkey.com">http://delta-intkey.com</a>	[Is a shade tolerant plant at some stage of its life cycle? Presumably Yes] "Distribution and habitat. Queensland, New South Wales. Moreton, Darling Downs, Wide Bay, Burnett, North Kennedy. North Coast (NC), Central Coast (CC), South Coast (SC). Wet eucalypt forest with rainforest understorey, or rainforest margins." [Rainforest understorey presumed to have low light levels]

410	1987. Morton, J.F.. Fruits of warm climates - Tree Tomato (Cyphomandra betacea). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html">http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html</a>	[Tolerates a wide range of soil conditions? Yes] "The tree tomato cannot tolerate tightly compacted soil with low oxygen content. It requires fertile, light soil. It grows well on deep lateritic soil in Haiti. Perfect drainage is necessary. Water standing for even a few days may kill the tree."
410	1996. Bajaj, Y.P.S.. Biotechnology in agriculture and forestry: Trees IV. Springer-Verlag, Berlin, Heidelberg, New York	[Tolerates a wide range of soil conditions? Yes] "Although C. betacea can be grown in a variety of soils and climates, there are some limitations to its cultivation imposed mainly by temperature, wind, and soil conditions."
411	1987. Morton, J.F.. Fruits of warm climates - Tree Tomato (Cyphomandra betacea). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html">http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html</a>	[Climbing or smothering growth habit? No] "The plant is a small, half-woody, attractive, fast-growing, brittle tree; shallow rooted; reaching 10 to 18 ft (3-5.5 m) in height; rarely as much as 25 ft (7.5 m)."
412	1988. Webb, C. J./Sykes, W.R./Garnock-Jones, P.J.. Flora of New Zealand, Volume IV: Naturalised pteridophytes, gymnosperms, dicotyledons. Botany Division, DSIR, Christchurch, New Zealand <a href="http://FloraSeries.LandcareResearch.co.nz">http://FloraSeries.LandcareResearch.co.nz</a>	[Forms dense thickets? No evidence to date]
412	1994. Bohs, L.. Cyphomandra (Solanaceae). Flora Neotropica. 63: 1-175.	[Forms dense thickets? No evidence to date]
412	2012. CSIRO. Australian Tropical Rainforest Plants [online database] - Solanum betaceum. <a href="http://keys.trin.org.au:8080/key-server/data/0e0f0504-0103-430d-8004-060d07080d04/media/html/taxon/Solanum_betaceum.htm">http://keys.trin.org.au:8080/key-server/data/0e0f0504-0103-430d-8004-060d07080d04/media/html/taxon/Solanum_betaceum.htm</a>	[Forms dense thickets? No evidence to date] "An introduced species originally from South America now naturalized in most parts of the higher rainfall parts of eastern coastal Queensland and south-eastern New South Wales. Altitudinal range in NEQ from 700-800 m (?) Grows in disturbed areas of upland rain forest, particularly on basalt."
412	2012. PlantNET. New South Wales flora online - Solanum betaceum Cav.. Royal Botanic Gardens & Domain Trust., Sydney <a href="http://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&amp;lvl=sp&amp;name=Solanum~betaceum">http://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&amp;lvl=sp&amp;name=Solanum~betaceum</a>	[Forms dense thickets? No evidence to date] "Distribution and occurrence: Cultivated for its edible fruits, occasionally naturalized in coastal areas; north from Tuross Heads area."
501	1987. Morton, J.F.. Fruits of warm climates - Tree Tomato (Cyphomandra betacea). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html">http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html</a>	[Aquatic? No] "The plant is a small, half woody, attractive, fast-growing, brittle tree; shallow-rooted; reaching 10 to 18 ft (3-5.5 m) in height; rarely as much as 25 ft (7.5 m)." [Terrestrial]
502	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. <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] Solanaceae
503	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. <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] Solanaceae
504	1987. Morton, J.F.. Fruits of warm climates - Tree Tomato (Cyphomandra betacea). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html">http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html</a>	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] "The plant is a small, half-woody, attractive, fast-growing, brittle tree; shallow-rooted; reaching 10 to 18 ft (3-5.5 m) in height; rarely as much as 25 ft (7.5 m)."
601	1994. Bohs, L.. Cyphomandra (Solanaceae). Flora Neotropica. 63: 1-175.	[Evidence of substantial reproductive failure in native habitat? No] "Cultivated throughout the Andes in subtropical climates, 1000-3000 m in elevation; probably introduced into Mexico, Central America, and the West Indies; in cultivation in Spain, Portugal, France, the United Kingdom, the Netherlands, Italy, the Canary Islands, Ghana, Ethiopia, Zaire, Uganda, Tanzania, Zimbabwe, South Africa, India, Ceylon, Bhutan, Sumatra, Java, New Guinea, New Caledonia, New Zealand, Australia, and the United States."
602	1987. Morton, J.F.. Fruits of warm climates - Tree Tomato (Cyphomandra betacea). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html">http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html</a>	[Produces viable seed? Yes] "Seeds or cuttings may be used for propagation. Seeds produce a high branched, erect tree, ideal for sheltered locations. Cuttings develop into a shorter, bushy plant with low-lying branches, suitable for exposed, windy sites. The tree does not always come true from seed, but is most likely to if one is careful to take seed from red fruits with black seed pulp or yellow fruits with yellow seed pulp."

602	2007. Love, K./Bowen, R./Fleming, K.. Twelve Fruits With Potential Value-Added and Culinary Uses. CTAHR, UH Manoa, Honolulu, HI <a href="http://www.ctahr.hawaii.edu/oc/freepubs/pdf/12fruits.pdf">http://www.ctahr.hawaii.edu/oc/freepubs/pdf/12fruits.pdf</a>	[Produces viable seed? Yes] "Tree tomatoes can be propagated by cuttings of 1–2 year-old growth and by seed. Tissue culture is practiced in New Zealand. Seeds tend to produce taller trees, better suited to protected areas, while trees from cuttings tend to be shorter and bushier, making them better for windy areas."
603	1991. Pringle, G.J./Murray, B.G.. Interspecific hybridisation involving the tamarillo, <i>Cyphomandra betacea</i> (Cav.) Sendt. (Solanaceae). <i>New Zealand Journal of Crop and Horticultural Science</i> . 19(2): 103-111.	[Hybridizes naturally? Possibly Yes] "The tamarillo, <i>Cyphomandra betacea</i> (Cav.) Sendt. (Solanaceae), is a minor fruit crop grown in New Zealand and in subtropical climates elsewhere around the world. There is little genetic variation in the cultigen, but characters of commercial importance have been observed in related wild species. <i>Cyphomandra betacea</i> was crossed with nine other <i>Cyphomandra</i> species. Generally, fruit set was poor and no viable seed was set in the crosses attempted. The use of polyploid forms of <i>C. betacea</i> in some species crosses did not enhance the success of interspecific hybridisation. Various stages of cross failure were identified, most of which were post zygotic. The data would suggest that incongruity, rather than the S locus, is governing interspecific compatibility in this genus. Suggestions are made for the future genetic improvement of the tamarillo by interspecific hybridisation."
603	1994. Bohs, L.. <i>Cyphomandra</i> (Solanaceae). <i>Flora Neotropica</i> . 63: 1-175.	[Hybridizes naturally? Possibly] "Bohs (1991) produced F1 hybrid plants from the following interspecific combinations (female parent listed first): <i>C. acuminata</i> x <i>betacea</i> , <i>C. betacea</i> x <i>acuminata</i> , <i>C. corymbiflora</i> x <i>diploconos</i> , <i>C. hartwegii</i> subspecies <i>ramosa</i> x <i>diploconos</i> , and <i>C. uniloba</i> x <i>betacea</i> . Morphological characteristics, breeding systems, pollen viability, and meiotic chromosome behavior were investigated in hybrid plants from three crossing combinations ( <i>C. betacea</i> x <i>acuminata</i> , <i>C. uniloba</i> x <i>betacea</i> , and <i>C. corymbiflora</i> x <i>diploconos</i> ). All hybrids were morphologically intermediate between the parent species. Both hybrid combinations with a <i>C. betacea</i> parent produced self-compatible F1 plant..." ... "fertile hybrids with <i>C. betacea</i> may have significance in breeding programs aimed at the improvement of the tree tomato." [Unknown if natural hybridization occurs]
604	1987. Morton, J.F.. <i>Fruits of warm climates - Tree Tomato (Cyphomandra betacea)</i> . J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html">http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html</a>	[Self-compatible or apomictic? Yes] "Tree tomato flowers are normally self pollinating. If wind is completely cut off so as not to stir the branches, this may adversely affect pollination unless there are bees to transfer the pollen. Unpollinated flowers will drop prematurely."
604	1994. Bohs, L.. <i>Cyphomandra</i> (Solanaceae). <i>Flora Neotropica</i> . 63: 1-175.	[Self-compatible or apomictic? Yes] "Breeding systems have been determined for ten species of <i>Cyphomandra</i> (Bohs, 1989a, 1991; Pringle & Murray, 1991c; Table IV). Of these, eight are self-incompatible (SI), and only two, <i>C. betacea</i> and <i>C. Cajanumensis</i> , are self-compatible (SC)."
605	1994. Bohs, L.. <i>Cyphomandra</i> (Solanaceae). <i>Flora Neotropica</i> . 63: 1-175.	[Requires specialist pollinators? No] "Bumblebees ( <i>Bombus</i> sp.) and honeybees ( <i>Apis mellifera</i> ) are common visitors to <i>C. betacea</i> flowers in New Zealand tree tomato orchards (Pringle & Murray, 1991c)."
605	2002. Knapp, S.. <i>Solanum</i> Section <i>Geminata</i> (Solanaceae). <i>Flora Neotropica</i> . 84: 1-404.	[Requires specialist pollinators? No] "Many, if not all, solanums are buzz pollinated by bees (Bowers, 1975; Buchmann, 1983; Buchmann et al., 1977; Linsley, 1962; Linsley & Cazier, 1963, 1972; Liu et al., 1975; Michener, 1962). Vibratile pollination is relatively widespread in angiosperms, occurring in about 200 genera (Buchmann, 1983). This phenomenon was first documented in <i>Solanum</i> in 1962, but was known from other genera much earlier (Michener, 1962; see discussion in Buchmann, 1983). Bees of many families possess the ability to vibrate <i>Solanum</i> anthers (see Table V III and references above). Interestingly, honey bees ( <i>Apis mellifera</i> L.) are unable to vibrate the anthers, and are thus not good <i>solanum</i> pollinators" ... "In some large-flowered species of <i>Solanum</i> only large bees, such as <i>Centris</i> , <i>Bombus</i> , and <i>Xylocopa</i> , are able to vibrate the entire anther cone and thus effect pollination."
605	2012. World Agroforestry Centre. <i>AgroForestry Tree Database - Cyphomandra betacea</i> . PROSEA, <a href="http://www.worldagroforestrycentre.org/sea/products/afdbases/af/asp/SpeciesInfo.asp?SpID=639">http://www.worldagroforestrycentre.org/sea/products/afdbases/af/asp/SpeciesInfo.asp?SpID=639</a>	[Requires specialist pollinators? No] " <i>C. betacea</i> is the only member of its genus known to be self-compatible. Flowers are self pollinating; wind and insects assist in pollen transfer, resulting in better fruit set."
606	1987. Morton, J.F.. <i>Fruits of warm climates - Tree Tomato (Cyphomandra betacea)</i> . J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html">http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html</a>	[Reproduction by vegetative fragmentation? No] "Seeds or cuttings may be used for propagation. Seeds produce a high branched, erect tree, ideal for sheltered locations. Cuttings develop into a shorter, bushy plant with low-lying branches, suitable for exposed, windy sites. The tree does not always come true from seed, but is most likely to if one is careful to take seed from red fruits with black seed pulp or yellow fruits with yellow seed pulp."

607	1987. Morton, J.F.. Fruits of warm climates - Tree Tomato (Cyphomandra betacea). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html">http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html</a>	[Minimum generative time (years)? 1 1/2+] "The tree usually begins to bear when 1 1/2 to 2 years old and continues to be productive for 5 or 6 years. If then adequately nourished, it may keep on fruiting for 11 to 12 years. In Brazil, each tree is expected to yield 44 to 66 lbs (20-30 kg) of fruit annually."
607	2007. Love, K./Bowen, R./Fleming, K.. Twelve Fruits With Potential Value-Added and Culinary Uses. CTAHR, UH Manoa, Honolulu, HI <a href="http://www.ctahr.hawaii.edu/oc/freepubs/pdf/12fruits.pdf">http://www.ctahr.hawaii.edu/oc/freepubs/pdf/12fruits.pdf</a>	[Minimum generative time (years)? 18 months+] "Trees will produce fruit after 18 months, but it is considered advisable to sacrifice the first year's crop to strengthen the root system and develop the plant."
701	1988. Webb, C. J./Sykes, W.R./Garnock-Jones, P.J.. Flora of New Zealand, Volume IV: Naturalised pteridophytes, gymnosperms, dicotyledons. Botany Division, DSIR, Christchurch, New Zealand <a href="http://FloraSeries.LandcareResearch.co.nz">http://FloraSeries.LandcareResearch.co.nz</a>	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? Possibly] "Waste places, rubbish dumps, forest clearings or margins near dwellings." [Presence in rubbish dumps suggests plants may be dispersed by green waste]
702	1994. Bohs, L.. Cyphomandra (Solanaceae). Flora Neotropica. 63: 1-175.	[Propagules dispersed intentionally by people? Yes] "The tree tomato is grown worldwide in subtropical areas for its edible fruits, but the natural range and place of origin of this species are still unknown."
703	1994. Bohs, L.. Cyphomandra (Solanaceae). Flora Neotropica. 63: 1-175.	[Propagules likely to disperse as a produce contaminant? No] "Fruit ellipsoidal or ovoid, obtuse or acute at apex, 4-10 cm long, 3-5 cm in diam., glabrous, yellow to orange, red, or purple, often with darker longitudinal stripes; mesocarp with stone cell aggregates; seeds 3 4 mm long, 3.54 mm wide, densely pubescent." [No evidence. Large fruit harvested and unlikely to become a produce contaminant]
704	1987. Morton, J.F.. Fruits of warm climates - Tree Tomato (Cyphomandra betacea). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html">http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html</a>	[Propagules adapted to wind dispersal? No] "The long-stalked, pendent fruit, borne singly, or in clusters of 3 to 12, is smooth, egg shaped but pointed at both ends and capped with the persistent conical calyx. In size it ranges from 2 to 4 in (5-10 cm) long and 1 1/2 to 2 in (4 5 cm) in width. Skin color may be solid deep purple, blood-red, orange or yellow, or red and-yellow, and may have faint dark, longitudinal stripes. Flesh color varies accordingly from orange-red or orange to yellow or cream-yellow."
705	1988. Webb, C. J./Sykes, W.R./Garnock-Jones, P.J.. Flora of New Zealand, Volume IV: Naturalised pteridophytes, gymnosperms, dicotyledons. Botany Division, DSIR, Christchurch, New Zealand <a href="http://FloraSeries.LandcareResearch.co.nz">http://FloraSeries.LandcareResearch.co.nz</a>	[Propagules water dispersed? No] "Presumably, birds occasionally act as dispersal agents." [No evidence that fruits are buoyant or dispersed by water]
706	1987. Morton, J.F.. Fruits of warm climates - Tree Tomato (Cyphomandra betacea). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html">http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html</a>	[Propagules bird dispersed? Presumably Yes] "The long-stalked, pendent fruit, borne singly, or in clusters of 3 to 12, is smooth, egg shaped but pointed at both ends and capped with the persistent conical calyx. In size it ranges from 2 to 4 in (5-10 cm) long and 1 1/2 to 2 in (4 5 cm) in width. Skin color may be solid deep purple, blood-red, orange or yellow, or red and-yellow, and may have faint dark, longitudinal stripes. Flesh color varies accordingly from orange-red or orange to yellow or cream-yellow."
706	1988. Webb, C. J./Sykes, W.R./Garnock-Jones, P.J.. Flora of New Zealand, Volume IV: Naturalised pteridophytes, gymnosperms, dicotyledons. Botany Division, DSIR, Christchurch, New Zealand <a href="http://FloraSeries.LandcareResearch.co.nz">http://FloraSeries.LandcareResearch.co.nz</a>	[Propagules bird dispersed? Yes] "Presumably, birds occasionally act as dispersal agents."
706	2006. Sullivan, J.J./Williams, P.A./Timmins, S.M.. Effects of Pinus radiata plantations on environmental weed invasion into adjacent native forest reserves. Science & Technical Publishing - Department of Conservation, Wellington, NZ	[Propagules bird dispersed? Yes] "Two species found in native forest tree fall gaps (Passiflora tripartita var. mollissima and Cyphomandra betaceae) were found neither in the adjacent landscape nor in the corresponding native forest edges. These last two observations illustrate how birds can disperse species to locations within native forest cores, irrespective of the nature of the native forest edge."
707	1994. Bohs, L.. Cyphomandra (Solanaceae). Flora Neotropica. 63: 1-175.	[Propagules dispersed by other animals (externally)] "Fruit ellipsoidal or ovoid, obtuse or acute at apex, 4-10 cm long, 3-5 cm in diam., glabrous, yellow to orange, red, or purple, often with darker longitudinal stripes; mesocarp with stone cell aggregates; seeds 3 4 mm long, 3.54 mm wide, densely pubescent."
708	1994. Bohs, L.. Cyphomandra (Solanaceae). Flora Neotropica. 63: 1-175.	[Propagules survive passage through the gut? Yes. Presumably adapted for internal dispersal] "Fruit ellipsoidal or ovoid, obtuse or acute at apex, 4-10 cm long, 3-5 cm in diam., glabrous, yellow to orange, red, or purple, often with darker longitudinal stripes; mesocarp with stone cell aggregates; seeds 3-4 mm long, 3.54 mm wide, densely pubescent."

708	2006. Albuquerque, L.B./Velázquez, A./Mayorga-Saucedo, Rafael. Solanaceae composition, pollination and seed dispersal syndromes in Mexican Mountain Cloud Forest. Acta Botanica Brasilica. 20(3): 599-613.	[Propagules survive passage through the gut? Yes. Presumably adapted for internal dispersal] "Table 4. Morphological features of the Solanaceae species recorded in the Mexican mountain cloud forests of Hidalgo, Mexico" [Cyphomandra betacea = Chiropterochory, bat-dispersed]
801	2007. Love, K./Bowen, R./Fleming, K.. Twelve Fruits With Potential Value-Added and Culinary Uses. CTAHR, UH Manoa, Honolulu, HI <a href="http://www.ctahr.hawaii.edu/oc/freepubs/pdf/12fruits.pdf">http://www.ctahr.hawaii.edu/oc/freepubs/pdf/12fruits.pdf</a>	[Prolific seed production (>1000/m <sup>2</sup> )? Unlikely] "In Hawai'i, trees will produce for up to 15 years with proper care and nutrition. On average, a cluster of 20 flowers will produce only four or five fruits. Flowers will abort if not pollinated"
802	2012. World Agroforestry Centre. AgroForestry Tree Database - Cyphomandra betacea. PROSEA, <a href="http://www.worldagroforestrycentre.org/sea/products/afdbases/af/asp/SpeciesInfo.asp?SpID=639">http://www.worldagroforestrycentre.org/sea/products/afdbases/af/asp/SpeciesInfo.asp?SpID=639</a>	[Evidence that a persistent propagule bank is formed (>1 yr)? No] "Orthodox storage behaviour; no loss in viability after 42 months of hermetic storage at -20 deg. C with 5.5% mc. Reduction in viability occurs after 8-10 months of storage at room temperature. There are about 100 000 seeds/kg." [Loss of viability at room temperature would likely be duplicated under field conditions]
803	2003. Motooka, P./Castro, L./Nelson, D./Nagai, G./Ching, L.. Weeds of Hawaii's Pastures and Natural Areas: An Identification and Management Guide. CTAHR, UH Manoa, Honolulu, HI <a href="http://www.ctahr.hawaii.edu/invweed/weedsHi.html">http://www.ctahr.hawaii.edu/invweed/weedsHi.html</a>	[Well controlled by herbicides? Yes]"Solanum torvum ... Management: Sensitive to foliar applied triclopyr and soil applied tebuthiuron." ..."Solanum linnaeanum ... Sensitive to foliar-applied dicamba. Susceptible to soil-applied tebuthiuron at 2 lb/acre(48). Goats control apple-of-Sodom (An Peischel). Seedlings are easily killed by cultivation or pulling(61)." [No specific control methods found for S. betaceum, but other weedy Solanum species are sensitive to herbicides]
804	1987. Morton, J.F.. Fruits of warm climates - Tree Tomato (Cyphomandra betacea). J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html">http://www.hort.purdue.edu/newcrop/morton/tree_tomato.html</a>	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes] "Seedling trees are pruned back the first year after planting to a height of 3 or 4 ft (0.9-1.2 m) to encourage branching. Annual pruning thereafter is advisable to eliminate branches that have already fruited and induce ample new shoots close to the main branches, inasmuch as fruit is produced on new growth. Otherwise, the tree will develop a broad top with fruits only on the outer fringe. And wide spreading branches are subject to wind damage. Pruning facilitates harvesting and, if timed appropriately, can extend the total fruiting period. Early spring pruning of some of the owners' trees brings about early maturity; fall pruning of other trees delays fruit maturity to the following fall."
805	2012. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol agents)? Unknown]

## **Summary of Risk Traits:**

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

- Naturalized & escaped in several locations
- Regarded as weedy in New Zealand & South Africa; Shade tolerant
- Unripe fruit potentially mildly toxic
- Tolerates many soil types
- Self-fertile (single trees can produce seeds)
- Reproductive in 1-2 years
- Seeds bird & bat dispersed (and possibly pigs or other mammals);  
Resprouts after repeated pruning

### **Low Risk / Desirable Traits:**

- Does not withstand very low temperatures or the very high tropical heat
- No evidence of major negative impacts where naturalized
- Large fruits & seeds unlikely to be accidentally dispersed
- Seeds not likely to persist in soil or form a seed bank