

Family: *Rutaceae*

Taxon: *Casimiroa edulis*

Synonym:

Common Name: casimiroa
Mexican-apple
white sapote

Questionnaire :	current 20090513	Assessor:	Patti Clifford	Designation: L
Status:	Assessor Approved	Data Entry Person:	Patti Clifford	WRA Score 2
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)	n
303	Agricultural/forestry/horticultural weed		n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed		n=0, y = 2*multiplier (see Appendix 2)	n
305	Congeneric weed		n=0, y = 1*multiplier (see Appendix 2)	n
401	Produces spines, thorns or burrs		y=1, n=0	n
402	Allelopathic		y=1, n=0	
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		y=1, n=0	
407	Causes allergies or is otherwise toxic to humans		y=1, n=0	y
408	Creates a fire hazard in natural ecosystems		y=1, n=0	n
409	Is a shade tolerant plant at some stage of its life cycle		y=1, n=0	n
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	
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	
803	Well controlled by herbicides	y=-1, n=1	
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	

Designation: L

WRA Score 2

Supporting Data:

101	2012. WRA Specialist. Personal Communication.	[Is the species highly domesticated?? No] No evidence of domestication that reduces invasive traits.
102	2012. WRA Specialist. Personal Communication.	[Has the species become naturalized where grown?] NA
103	2012. WRA Specialist. Personal Communication.	[Does the species have weedy races?] NA
201	2012. USDA, ARS, National Genetic Resources Program. <i>Casimiroa edulis</i> - Germplasm Resources Information Network - (GRIN) [online database]. National Germplasm Resources Laboratory, Beltsville, Maryland http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?92	[Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"? 2- High] Native range: Mexico - San Luis Potosi, Federal District, Hidalgo, Jalisco, Mexico, Michoacan, Morelos, Oaxaca, Queretaro, Veracruz; Costa Rica; El Salvador; Guatemala.
202	2012. USDA, ARS, National Genetic Resources Program. <i>Casimiroa edulis</i> - Germplasm Resources Information Network - (GRIN) [online database]. National Germplasm Resources Laboratory, Beltsville, Maryland http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?92	[Quality of climate match data? 2 - High] Native range: Mexico - San Luis Potosi, Federal District, Hidalgo, Jalisco, Mexico, Michoacán, Morelos, Oaxaca, Queretaro, Veracruz; Costa Rica; El Salvador; Guatemala.
203	1987. Morton, J.. Fruits of warm climates - White sapote (<i>Casimiroa edulis</i>). Julia F. Morton, Miami, Florida http://www.hort.purdue.edu/newcrop/morton/white_sapote.html	[Broad climate suitability (environmental versatility)? Yes] "The white sapotes can be classed as subtropical rather than tropical. <i>C. edulis</i> is usually found growing naturally at elevations between 2,000 and 3,000 ft (600-900 m) and occasionally in Guatemala up to a maximum of 9,000 ft (2,700 m) in areas not subject to heavy rainfall."
203	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	[Broad climate suitability (environmental versatility)? Yes] In its native range, <i>Casimiroa edulis</i> thrives at elevations of 2,000-8,800 ft.
204	1987. Morton, J.. Fruits of warm climates - White sapote (<i>Casimiroa edulis</i>). Julia F. Morton, Miami, Florida http://www.hort.purdue.edu/newcrop/morton/white_sapote.html	[Native or naturalized in regions with tropical or subtropical climates? Yes] "The white sapotes can be classed as subtropical rather than tropical. <i>C. edulis</i> is usually found growing naturally at elevations between 2,000 and 3,000 ft (600-900 m) and occasionally in Guatemala up to a maximum of 9,000 ft (2,700 m) in areas not subject to heavy rainfall."
204	2001. Werren, G.. Environmental Weeds of the Wet Tropics Bioregion: Risk Assessment & Priority Ranking. Rainforest CRC, Cairns, Australia http://www.wetropics.gov.au/res/downloads/Weeds.pdf	[Native or naturalized in regions with tropical or subtropical climates? Yes] Naturalized in the wet tropic bioregion of Queensland.
205	1987. Morton, J.. Fruits of warm climates - White sapote (<i>Casimiroa edulis</i>). Julia F. Morton, Miami, Florida http://www.hort.purdue.edu/newcrop/morton/white_sapote.html	[Does the species have a history of repeated [Introductions outside its natural range? Yes] "The common white sapote occurs both wild and cultivated in central Mexico. It is planted frequently in Guatemala, El Salvador and Costa Rica and is occasionally grown in northern South America, the Bahamas, West Indies, along the Riviera and other parts of the Mediterranean region, India and the East Indies. It is grown commercially in the Gisborne district of New Zealand and to some extent in South Africa. Horticulturists in Israel took serious interest in white sapotes around 1935 and planted a number of varieties. The trees grew well and produced little in the coastal plain; bore good crops in the interior and commercial prospects seemed bright but the fruit did not appeal to consumers and was too attractive to fruit flies. White sapotes have not done well in the Philippines. The common species was introduced into California by Franciscan monks about 1810, and it is still cultivated on a limited scale in the southern part of that state. In Florida, it was first planted with enthusiasm."
205	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	[Does the species have a history of repeated [Introductions outside its natural range? Yes] Cultivated for its edible fruit throughout Central America, northern South America, the West Indies, South Africa, Israel, India, and in southern California and Florida. Also grown in Hawaii, where it is adapted to cooler uplands.
301	2001. Werren, G.. Environmental Weeds of the Wet Tropics Bioregion: Risk Assessment & Priority Ranking. Rainforest CRC, Cairns, Australia http://www.wetropics.gov.au/res/downloads/Weeds.pdf	[Naturalized beyond native range? Yes] Naturalized in the wet tropic bioregion of Queensland.

302	2007. Randall, R.. Global Compendium of Weeds- <i>Casimiroa edulis</i> . http://www.hear.org/gcw/species/casimiroa_edulis/	[Garden/amenity/disturbance weed? No] No evidence.
303	2007. Randall, R.. Global Compendium of Weeds- <i>Casimiroa edulis</i> . http://www.hear.org/gcw/species/casimiroa_edulis/	[Agricultural/forestry/horticultural weed? No] No evidence.
304	2007. Randall, R.. Global Compendium of Weeds- <i>Casimiroa edulis</i> . http://www.hear.org/gcw/species/casimiroa_edulis/	[Environmental weed? No] Although the Global Compendium of weeds states that <i>Casimiroa edulis</i> is an environmental weed, there is no evidence of control or impacts]
305	2007. Randall, R.P.. Global Compendium of Weeds - Index [Online Database]. http://www.hear.org/gcw/	[Congeneric weed? No] No evidence.
401	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	[Produces spines, thorns or burrs? No] Evergreen, round-crowned tree to 50' tall; bran drooping. Lf peti ca 4" long; lflets usu 5 (3-7), ovate to elliptic or obovate, 2-5" x 1-2", upper side glabrous, underside sparsely pubescent, apex acute or tapering.
402	2012. WRA Specialist. Personal Communication.	[Allelopathic? Unknown]
403	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	[Parasitic? No] Rutaceae.
404	2000. Wilkinson, K.M./Elevitch, C.R.. Multipurpose windbreaks: design and species for Pacific Islands. Agroforestry guides for Pacific Islands #4. Permanent Agriculture Resources, Holualoa, Hawaii http://www.agroforestry.net/	[Unpalatable to grazing animals? No] Potential fodder species.
404	2007. Jimenez-Ferrer, G./Perez-Lopez, H./Soto-Pinto, L./Nahe-Toral, J./Hernandez-Lopez, L./Carmona de la Torre, J.. Livestock, nutritive value and local knowledge of fodder trees in fragment landscapes in Chiapas, Mexico. <i>Interciencia</i> . 32: 274-280. http://	[Unpalatable to grazing animals? No] <i>Casimiroa edulis</i> is used as a fodder tree in Chiapas, Mexico. It is considered one of the preferred fodder trees.
405	1987. Morton, J.. Fruits of warm climates - White sapote (<i>Casimiroa edulis</i>). Julia F. Morton, Miami, Florida http://www.hort.purdue.edu/newcrop/morton/white_sapote.html	[Toxic to animals? Yes] The seed is said to be fatally toxic if eaten raw by humans or animals.
406	1987. Morton, J.. Fruits of warm climates - White sapote (<i>Casimiroa edulis</i>). Julia F. Morton, Miami, Florida http://www.hort.purdue.edu/newcrop/morton/white_sapote.html	[Host for recognized pests and pathogens?] "The white sapote has few natural enemies but the fruits of some cultivars are attacked by fruit flies. Black scale often occurs on nursery stock and occasionally on mature trees in California."
406	1993. Hallman, G.J.. Potential quarantine treatmentst for white sapote. <i>Journal of Economic Entomology</i> . 86: 793-797.	[Host for recognized pests and pathogens?] Host of Caribbean fruit fly, <i>Anastrepha suspensa</i> .
406	2005. Davis, E.E./French, S./Venette, R.C.. Mini risk assessment - fruit piercing moth: <i>Eudocima fullonia</i> Green [Lepidoptera: Noctuidae]. Aphis.USDA.gov, http://www.aphis.usda.gov/plant_health/plant_pest_info/pest_detection/downloads/prafulloniapra.pdf	[Host for recognized pests and pathogens?] <i>Casimiroa edulis</i> is a host for <i>Eudocima fullonia</i> , (fruit piercing moth). <i>Eudocima</i> is present in Hawaii, but there are many hosts in Hawaii for this economic pest.
407	1987. Morton, J.. Fruits of warm climates - White sapote (<i>Casimiroa edulis</i>). Julia F. Morton, Miami, Florida http://www.hort.purdue.edu/newcrop/morton/white_sapote.html	[Causes allergies or is otherwise toxic to humans? Yes] The seed is said to be fatally toxic if eaten raw by humans or animals.
407	2005. Ticktin, T./Dalle, S.P.. Medicinal plant use in the practice of midwifery in rural Honduras. <i>Journal of Ethnopharmacology</i> . 96: 233-248.	[Causes allergies or is otherwise toxic to humans?] The bark (as a decoction) of <i>Casimiroa edulis</i> is used by midwives in Honduras to alleviate postpartum abdominal pain.

408	2012. WRA Specialist. Personal Communication.	[Creates a fire hazard in natural ecosystems? No] No evidence of biomass buildup that would promote fires.
409	1996. California Rare Fruit Growers. Casimiroa edules Llave & Lex Rutaceae. California Rare Fruit Growers Inc., http://www.crfg.org/pubs/ff/whitesapote.html	[Is a shade tolerant plant at some stage of its life cycle? No] Full sun.
409	2012. Dave's Garden. PlantFiles: White sapote, Mexican apple, Casimiroa edulis. Dave's Garden, http://davesgarden.com/guides/pf/go/62618/	[Is a shade tolerant plant at some stage of its life cycle? No] Full sun.
410	1987. Morton, J.. Fruits of warm climates - White sapote (Casimiroa edulis). Julia F. Morton, Miami, Florida http://www.hort.purdue.edu/newcrop/morton/white_sapote.html	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)? Yes] "As long as there is good drainage, the trees will do very well on sandy loam or even on clay. In California, some of the early plantings were on light, decomposed granite soil, and they were fruitful for many years. In Florida, the trees grow and fruit well on deep sand and on oolitic limestone, though, on the latter, they may become chlorotic. They are fairly drought-resistant."
410	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, (http://www.worldagroforestry.org/af/treedb/)	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)? Yes] Soil type: Well drained sandy loam or even on clay, decomposed granite soil, oolitic limestone.
411	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	[Climbing or smothering growth habit? No] Evergreen, round-crowned tree to 50' tall.
412	2012. WRA Specialist. Personal Communication.	[Forms dense thickets? Unknown].
501	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	[Aquatic? No] Evergreen, round-crowned tree to 50' tall.
502	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	[Grass? No] Rutaceae; tree.
503	2000. Wilkinson, K.M./Elevitch, C.R.. Multipurpose windbreaks: design and species for Pacific Islands. Agroforestry guides for Pacific Islands #4. Permanent Agriculture Resources, Holoaloa, Hawaii http://www.agroforestry.net/	[Nitrogen fixing woody plant? No] Not a nitrogen fixer.
504	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	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] Evergreen, round-crowned tree to 50' tall.
601	2012. WRA Specialist. Personal Communication.	[Evidence of substantial reproductive failure in native habitat? No] No evidence.
602	1987. Morton, J.. Fruits of warm climates - White sapote (Casimiroa edulis). Julia F. Morton, Miami, Florida http://www.hort.purdue.edu/newcrop/morton/white_sapote.html	[Produces viable seed? Yes] "White sapotes are commonly grown from seeds."
602	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	[Produces viable seed? Yes] "Most of the white sapote trees in Hawaii are grown from seeds, do not become fruit-bearing until they are seven or eight years old"
603	2012. WRA Specialist. Personal Communication.	[Hybridizes naturally? Unknown]
604	2012. WRA Specialist. Personal Communication.	[Self-compatible or apomictic? Unknown]

605	1987. Morton, J.. Fruits of warm climates - White sapote (<i>Casimiroa edulis</i>). Julia F. Morton, Miami, Florida http://www.hort.purdue.edu/newcrop/morton/white_sapote.html	[Requires specialist pollinators? No] "There is a great variation in the amount of pollen produced by seedlings and grafted cultivars. Some flowers bear no pollen grains; others have an abundance. Sterile pollen or lack of cross-pollination are suggested causes of aborted seeds and heavy shedding of immature fruits. In Florida, flowers of some heavy-bearing, double-cropping, trees have been observed so heavily worked by bees that their humming is heard several feet away."
605	1996. California Rare Fruit Growers. <i>Casimiroa edules</i> Llave & Lex Rutaceae. California Rare Fruit Growers Inc., http://www.crfg.org/pubs/ff/whitesapote.html	[Requires specialist pollinators? No] The flowers are attractive to bees, hoverflies and ants.
606	1996. California Rare Fruit Growers. <i>Casimiroa edules</i> Llave & Lex Rutaceae. California Rare Fruit Growers Inc., http://www.crfg.org/pubs/ff/whitesapote.html	[Reproduction by vegetative fragmentation? No] Grown from seeds or grafted.
606	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	[Reproduction by vegetative fragmentation? No] Grown from seeds.
607	1987. Morton, J.. Fruits of warm climates - White sapote (<i>Casimiroa edulis</i>). Julia F. Morton, Miami, Florida http://www.hort.purdue.edu/newcrop/morton/white_sapote.html	[Minimum generative time (years)? >3] "White sapotes are commonly grown from seeds and seedlings usually begin to bear in 7 or 8 years. Grafting is a common practice in California and Florida in midsummer. Seedlings of 'Pike', being vigorous growers, are preferred as rootstock. Shield-budding and side-grafting in spring onto stocks up to 3/4 in (2 cm) thick give good results. Cleft grafts and slot grafts are made on larger rootstocks and when topworking mature trees. Grafted trees will start bearing in 3 or 4 years."
607	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	[Minimum generative time (years)? >3] "Most of the white sapote trees in Hawaii are grown from seeds, do not become fruit-bearing until they are seven or eight years old"
701	2012. WRA Specialist. Personal Communication.	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? No] No evidence of accidental dispersal.
702	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	[Propagules dispersed intentionally by people? Yes] Cultivated for its edible fruit throughout Central America, northern South America, the West Indies, South Africa, Israel, India, and in southern California and Florida. Also grown in Hawaii, where it is adapted to cooler uplands.
703	1987. Morton, J.. Fruits of warm climates - White sapote (<i>Casimiroa edulis</i>). Julia F. Morton, Miami, Florida http://www.hort.purdue.edu/newcrop/morton/white_sapote.html	[Propagules likely to disperse as a produce contaminant? No] "The fruit is round, oval or ovoid, symmetrical or irregular, more or less distinctly 5-lobed; 2 1/2 to 4 1/2 in (6.25-11.25 cm) wide and up to 4 3/4 in (12 cm) in ."
703	2012. WRA Specialist. Personal Communication.	[Propagules likely to disperse as a produce contaminant? No] No evidence.
704	1987. Morton, J.. Fruits of warm climates - White sapote (<i>Casimiroa edulis</i>). Julia F. Morton, Miami, Florida http://www.hort.purdue.edu/newcrop/morton/white_sapote.html	[Propagules adapted to wind dispersal? No] "The fruit is round, oval or ovoid, symmetrical or irregular, more or less distinctly 5-lobed; 2 1/2 to 4 1/2 in (6.25-11.25 cm) wide and up to 4 3/4 in (12 cm) in length." [no adaptation for wind dispersal]
705	2012. WRA Specialist. Personal Communication.	[Propagules water dispersed? Unknown]
706	2012. WRA Specialist. Personal Communication.	[Propagules bird dispersed? Unknown]
707	1987. Morton, J.. Fruits of warm climates - White sapote (<i>Casimiroa edulis</i>). Julia F. Morton, Miami, Florida http://www.hort.purdue.edu/newcrop/morton/white_sapote.html	[Propagules dispersed by other animals (externally)? No] "Mature fruits must be clipped from the branches leaving a short piece of stem attached. This stub will fall off naturally when the fruits become eating-ripe. If plucked by hand, the fruits will separate from the stem if given a slight twist but they will soon show a soft bruised spot at the stem-end which quickly spreads over much of the fruit, becoming watery and decayed." [no means of external attachment]
708	2011. Kunz, T.H./Braun de Torrez, E./Bauer, D./Lobova, T./Fleming, T.H.. Ecosystem services provided by bats. <i>Annals of the New York Academy of Sciences</i> . 1223: 1-38. http://www.caves.org/WNS/WNS%20Kunz%20April%205%20%202011.pdf	[Propagules survive passage through the gut? Yes] Dispersed by bats.

801	1987. Morton, J.. Fruits of warm climates - White sapote (<i>Casimiroa edulis</i>). Julia F. Morton, Miami, Florida http://www.hort.purdue.edu/newcrop/morton/white_sapote.html	[Prolific seed production (>1000/m2) No] "There may be 1 to 6 plump, oval, hard, white seeds, 1 to 2 in (2.5-5 cm) long and 1/2 to 1 in (1.25-2.5 cm) thick, but often some seeds are under-developed (aborted) and very thin.
801	1996. California Rare Fruit Growers. <i>Casimiroa edules</i> Llave & Lex Rutaceae. California Rare Fruit Growers Inc., http://www.crfg.org/pubs/ff/whitesapote.html	[Prolific seed production (>1000/m2) No] The fruit contains 5 - 7 short-lived seeds that resemble a greatly enlarged orange seed. They range in size from 1 - 2 inches in length. The fruits also usually contain several aborted, thin, papery seeds.
802	2012. WRA Specialist. Personal Communication.	[Evidence that a persistent propagule bank is formed (>1 yr)? Unknown].
803	2012. WRA Specialist. Personal Communication.	[Well controlled by herbicides? Unknown].
804	1996. California Rare Fruit Growers. <i>Casimiroa edules</i> Llave & Lex Rutaceae. California Rare Fruit Growers Inc., http://www.crfg.org/pubs/ff/whitesapote.html	[Tolerates, or benefits from, mutilation, cultivation, or fire?] "Young trees tend to grow vertically without much branching. After planting, remove the flowers and pinch out the terminal bud to encourage branching. Since branches are brittle in wind, and will often break at crotches that are either too narrow or horizontal, it is important to prune to eliminate such weak joints. Too much pruning or heading-back, however, may encourage weak growth. "
804	2012. WRA Specialist. Personal Communication.	[Tolerates, or benefits from, mutilation, cultivation, or fire? Unknown]
805	2012. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol agents)? Unknown].