

Taxon: <i>Ilex cassine</i> L.	Family: Aquifoliaceae
Common Name(s): dahoon dahoon holly	Synonym(s): <i>Ilex cassine</i> L. var. <i>angustifolia</i> Aiton <i>Ilex cassine</i> L. var. <i>cassine</i> <i>Ilex cassine</i> L. var. <i>mexicana</i> (Turcz.)

Assessor: Chuck Chimera	Status: Assessor Approved	End Date: 24 Jun 2019
WRA Score: 9.0	Designation: H(HPWRA)	Rating: High Risk

Keywords: Dioecious Tree, Naturalized, Water-Dispersed, Bird-Dispersed, Resprouter

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	n
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)	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	n
405	Toxic to animals		
406	Host for recognized pests and pathogens	y=1, n=0	n
407	Causes allergies or is otherwise toxic to humans		
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

Qsn #	Question	Answer Option	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	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	y
604	Self-compatible or apomictic	y=1, n=-1	n
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation		
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)		
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	y
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 ²)	y=1, n=-1	n
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	y
803	Well controlled by herbicides		
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
	Wunderlin, R. P., & Poppleton, J. E. (1977). The Florida species of <i>Ilex</i> (Aquifoliaceae). <i>Florida Scientist</i> , 40(1), 7-21	No evidence of domestication

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	NA

201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	High
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 21 Jun 2019]	"Native Northern America SOUTHEASTERN U.S.A.: United States [Alabama (s.), Florida, Georgia (s.), Louisiana, North Carolina (e.), South Carolina, Mississippi (s.)] SOUTH-CENTRAL U.S.A.: United States [Texas] Southern America CARIBBEAN: Bahamas, United States [Puerto Rico (n.e.)]"

202	Quality of climate match data	High
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 21 Jun 2019]	

Qsn #	Question	Answer
203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	Floridata. (2019). <i>Ilex cassine</i> . https://floridata.com/plant/55 . [Accessed 21 Jun 2019]	"Hardiness: USDA Zones 5-10."
	Gilman, E.F., Watson, D.G., Klein, R.W., Koeser, A.K., Hilbert, D.R. and McLean, D.C. (2018). <i>Ilex cassine</i> : Dahoon Holly. ENH458. UF/IFAS Extension, University of Florida, Gainesville, FL. https://edis.ifas.ufl.edu . [Accessed 21 Jun 2019]	"USDA hardiness zones: 7A through 11"

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	Imada, C. T., Staples, G. W. & Herbst, D. R. 2000. New Hawaiian plant records for 1999. Bishop Museum Occasional Papers 63: 9-16	" <i>Ilex cassine</i> L. New naturalized record Dahoon holly has been cultivated in Hawai'i since the early 1940s (or earlier) but has not previously been found naturalized in the state. The following 2 collections document its existence outside of cultivation on 2 islands. Collectors are encouraged to seek it on others. This holly fits the profile for bird-dispersed plants with its abundant, rather fleshy, bright red fruits containing multiple seeds contained in a hard pit. Material examined: O'AHU: Whitmore Village, ca 0.5 mi above fence along dirt road, growing among eucalyptus and other exotics, about 25–30 plants seen, all size classes present, 16 Dec 1998, M. Keir 1. HAWAI'I: Puna Distr, land of 'Öla'a, along Hwy 11 to Volcano, 17.4 miles from Hilo, 1850 ft, 16 Dec 1975, D. Herbst & S. Ishikawa 5603; along Hilo to Volcano Hwy at ca mile marker 18, small but growing naturalized population, 4 Apr 1985, L. Stemmermann 6931."
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 21 Jun 2019]	"Native Northern America SOUTHEASTERN U.S.A.: United States [Alabama (s.), Florida, Georgia (s.), Louisiana, North Carolina (e.), South Carolina, Mississippi (s.)] SOUTH-CENTRAL U.S.A.: United States [Texas] Southern America CARIBBEAN: Bahamas, United States [Puerto Rico (n.e.)]"

205	Does the species have a history of repeated introductions outside its natural range?	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.	" <i>Ilex cassine</i> L. has been planted along the highway from Hilo to Volcano on Hawai'i, and in Honolulu, O'ahu"

301	Naturalized beyond native range	y
	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.	" <i>Ilex cassine</i> L. has been planted along the highway from Hilo to Volcano on Hawai'i, and in Honolulu, O'ahu, but it does not appear to have become naturalized. It differs from the 2 species below in its red to yellow fruit and narrowly oblanceolate to elliptic leaves with entire margins, rarely with a few small teeth in the upper half." [Now reported as naturalized in Imada et al. 2000]
	Imada, C. T., Staples, G. W. & Herbst, D. R. 2000. New Hawaiian plant records for 1999. Bishop Museum Occasional Papers 63: 9-16	" <i>Ilex cassine</i> L. New naturalized record Dahoon holly has been cultivated in Hawai'i since the early 1940s (or earlier) but has not previously been found naturalized in the state. The following 2 collections document its existence outside of cultivation on 2 islands. Collectors are encouraged to seek it on others. This holly fits the profile for bird-dispersed plants with its abundant, rather fleshy, bright red fruits containing multiple seeds contained in a hard pit. Material examined: O'AHU: Whitmore Village, ca 0.5 mi above fence along dirt road, growing among eucalyptus and other exotics, about 25-30 plants seen, all size classes present, 16 Dec 1998, M. Keir 1. HAWAII: Puna Distr, land of 'Öla'a, along Hwy 11 to Volcano, 17.4 miles from Hilo, 1850 ft, 16 Dec 1975, D. Herbst & S. Ishikawa 5603; along Hilo to Volcano Hwy at ca mile marker 18, small but growing naturalized population, 4 Apr 1985, L. Stemmermann 6931."

302	Garden/amenity/disturbance weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

304	Environmental weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

305	Congeneric weed	y
	Source(s)	Notes
	Weber, E. 2017. Invasive Plant Species of the World, 2nd Edition: A Reference Guide to Environmental Weeds. CAB International, Wallingford, UK	" <i>Ilex aquifolium</i> ... The shrub is invasive because it forms dense thickets on the forest floor, changing the structure of invaded forests by adding a tall and species-poor shrub layer. Native plants are crowded out and their regeneration is prevented. Since English holly is shade tolerant, the shrub is able to invade nearly undisturbed vegetation"

401	Produces spines, thorns or burrs	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Wunderlin, R. P., & Poppleton, J. E. (1977). The Florida species of <i>Ilex</i> (Aquifoliaceae). <i>Florida Scientist</i> , 40(1), 7-21	"Shrub or small tree to 12 m; branches puberulent or glabrate. Leaves evergreen, elliptic to obovate. 3-14 cm long. 2-5 cm wide. bristle-tipped at apex, rounded to cuneate at base, margin entire or with a few spinulose-serrate teeth, teeth (if present) and apex armed with a spine less than 1 mm long. revolute, glabrous above, pubescent to glabrate below" [Minute spines sometimes present at leaf apex]
	Staples, G.W. & Herbst, D.R. 2005. <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI	[No evidence] "Evergreen shrub or treelet usually to 15 (-35) feet tall; bark often whitish, young stems usually pubescent. Leaf blades obovate-oblong to oblanceolate, 2-5 inches x 0.8-1.4 inches, upper side dark green and glabrous, underside ± whitish gray-pubescent, papery to leathery, entire or apex weakly toothed, apex rounded or slightly notched. Inflorescence of stalked clusters in leaf axils or along stem between leaves. Flowers ca 0.2 inches in diameter, white; male flowers to 15 per cluster; female flowers 1-5 per cluster. Fruit in stalked clusters, globose, 0.25-0.3 inches in diameter, red (or yellow), stones 1-4, ribbed"

402	Allelopathic	n
	Source(s)	Notes
	USDA Natural Resources Conservation Service. (2019). Conservation Plant Characteristics - <i>Ilex cassine</i> . https://plants.usda.gov/java/charProfile?symbol=ILCA . [Accessed 24 Jun 2019]	"Known Allelopath: No"

403	Parasitic	n
	Source(s)	Notes
	Wunderlin, R. P., & Poppleton, J. E. (1977). The Florida species of <i>Ilex</i> (Aquifoliaceae). <i>Florida Scientist</i> , 40(1), 7-21	"Shrub or small tree to 12 m" [Aquifoliaceae. No evidence]

404	Unpalatable to grazing animals	n
	Source(s)	Notes
	USDA Natural Resources Conservation Service. (2019). Conservation Plant Characteristics - <i>Ilex cassine</i> . https://plants.usda.gov/java/charProfile?symbol=ILCA . [Accessed 24 Jun 2019]	"Palatable Browse Animal Low Palatable Graze Animal Low"
	Halls, L. K. (1964). Forage and cattle management in longleaf-slash pine forests. <i>Farmers' Bulletin</i> No. 2199. US Dept. of Agriculture, Washington, D.C.	"The principal forage plants, their prevalence, site preference, and season of greatest use by cattle are listed in table 1 ." [TABLE 1.- Principal forage plants in longleaf-slash pine forest ranges... Dahoon (<i>Ilex cassine</i>) - Season of greatest use - Fall and winter]

405	Toxic to animals	n
	Source(s)	Notes

Qsn #	Question	Answer
	Plants for a Future. (2019). <i>Ilex cassine</i> . https://pfaf.org . [Accessed 24 Jun 2019]	"Although no specific reports of toxicity have been seen for this species, the fruits of at least some members of this genus contain saponins and are slightly toxic. They can cause vomiting, diarrhoea and stupor if eaten in quantity[274]."
	USDA Natural Resources Conservation Service. (2019). Conservation Plant Characteristics - <i>Ilex cassine</i> . https://plants.usda.gov/java/charProfile?symbol=ILCA . [Accessed 24 Jun 2019]	"Toxicity: Slight" [Toxicity to animals unknown, but some palatability reported]

406	Host for recognized pests and pathogens	n
	Source(s)	Notes
	Gilman, E.F., Watson, D.G., Klein, R.W., Koeser, A.K., Hilbert, D.R. and McLean, D.C. (2018). <i>Ilex cassine</i> : Dahoon Holly. ENH458. UF/IFAS Extension, University of Florida, Gainesville, FL. https://edis.ifas.ufl.edu . [Accessed 24 Jun 2019]	"No pests or diseases are of major concern. A twig gall sometimes forms in response to a fungus infection. Mites can infest foliage on trees planted on dry sites."

407	Causes allergies or is otherwise toxic to humans	
	Source(s)	Notes
	Plants for a Future. (2019). <i>Ilex cassine</i> . https://pfaf.org . [Accessed 24 Jun 2019]	"Although no specific reports of toxicity have been seen for this species, the fruits of at least some members of this genus contain saponins and are slightly toxic. They can cause vomiting, diarrhea and stupor if eaten in quantity[274]."
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	" <i>Ilex cassine</i> ... Diaphoretic. Ceremonial."
	USDA Natural Resources Conservation Service. (2019). Conservation Plant Characteristics - <i>Ilex cassine</i> . https://plants.usda.gov/java/charProfile?symbol=ILCA . [Accessed 24 Jun 2019]	Toxicity: Slight

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Plants for a Future. (2019). <i>Ilex cassine</i> . https://pfaf.org . [Accessed 24 Jun 2019]	"Habitats Cold swamps and on their borders in rich moist soils. Occasionally also found on high sandy banks of pine barren streams" [No evidence. Probably not - An evergreen tree with thick leaves]
	USDA Natural Resources Conservation Service. (2019). Conservation Plant Characteristics - <i>Ilex cassine</i> . https://plants.usda.gov/java/charProfile?symbol=ILCA . [Accessed 24 Jun 2019]	Fire Tolerance: High

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	Notes
	Plants for a Future. (2019). <i>Ilex cassine</i> . https://pfaf.org . [Accessed 24 Jun 2019]	"It can grow in semi-shade (light woodland) or no shade."

Qsn #	Question	Answer
	Gilman, E.F., Watson, D.G., Klein, R.W., Koeser, A.K., Hilbert, D.R. and McLean, D.C. (2018). <i>Ilex cassine</i> : Dahoon Holly. ENH458. UF/IFAS Extension, University of Florida, Gainesville, FL. https://edis.ifas.ufl.edu . [Accessed 24 Jun 2019]	"Light requirement: full sun to partial shade"
	Floridata. (2019). <i>Ilex cassine</i> . https://floridata.com/plant/55 . [Accessed 24 Jun 2019]	"Light: Dahoon is adaptable to most conditions from full sun to deep shade."
	USDA Natural Resources Conservation Service. (2019). Conservation Plant Characteristics - <i>Ilex cassine</i> . https://plants.usda.gov/java/charProfile?symbol=ILCA . [Accessed 24 Jun 2019]	"Shade Tolerance = Tolerant"
	NC State Extension. (2019). <i>Ilex cassine</i> . https://plants.ces.ncsu.edu/plants/all/ilex-cassine/ . [Accessed 24 Jun 2019]	"Site: Sun to partial shade; range of soil types including wet soil"

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	NC State Extension. (2019). <i>Ilex cassine</i> . https://plants.ces.ncsu.edu/plants/all/ilex-cassine/ . [Accessed 24 Jun 2019]	"Site: Sun to partial shade; range of soil types including wet soil"
	Florida Native Plant Society. (2019). <i>Ilex cassine</i> . https://www.fnps.org/plants/plant/ilex-cassine . [Accessed 24 Jun 2019]	"Soil or other substrate: Sand, loam Soil pH Range: acidic to circumneutral"
	Gilman, E.F., Watson, D.G., Klein, R.W., Koeser, A.K., Hilbert, D.R. and McLean, D.C. (2018). <i>Ilex cassine</i> : Dahoon Holly. ENH458. UF/IFAS Extension, University of Florida, Gainesville, FL. https://edis.ifas.ufl.edu . [Accessed 24 Jun 2019]	"Soil tolerances: clay; sand; loam; slightly alkaline; acidic; wet to well-drained" ... "Growing well in full sun to partial shade, dahoon holly does best on moist soils since the wet, boggy soils of swamps is its native environment. Dahoon holly can tolerate drier locations with some watering, but often has a thin crown in this environment."
	Plants for a Future. (2019). <i>Ilex cassine</i> . https://pfaf.org . [Accessed 24 Jun 2019]	"Tolerates most soils that are not water-logged[200]."

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Wunderlin, R. P., & Poppleton, J. E. (1977). The Florida species of <i>Ilex</i> (Aquifoliaceae). <i>Florida Scientist</i> , 40(1), 7-21	"Shrub or small tree to 12 m"

412	Forms dense thickets	n
	Source(s)	Notes
	Brockman, C. F. (2002). <i>Trees of North America: A Guide to Field Identification, Revised and Updated</i> . St. Martin's Press, New York, NY	"Dahoon grows to 30 feet tall and 1.5 feet in diameter. It is often common in moist soils."

Qsn #	Question	Answer
	Imada, C. T., Staples, G. W. & Herbst, D. R. 2000. New Hawaiian plant records for 1999. Bishop Museum Occasional Papers 63: 9-16	[No evidence] " <i>Ilex cassine</i> L. New naturalized record Dahoon holly has been cultivated in Hawai'i since the early 1940s (or earlier) but has not previously been found naturalized in the state. The following 2 collections document its existence outside of cultivation on 2 islands. Collectors are encouraged to seek it on others. This holly fits the profile for bird-dispersed plants with its abundant, rather fleshy, bright red fruits containing multiple seeds contained in a hard pit. Material examined: O'AHU: Whitmore Village, ca 0.5 mi above fence along dirt road, growing among eucalyptus and other exotics, about 25–30 plants seen, all size classes present, 16 Dec 1998, M. Keir 1. HAWAII: Puna Distr, land of 'Ōla'a, along Hwy 11 to Volcano, 17.4 miles from Hilo, 1850 ft, 16 Dec 1975, D. Herbst & S. Ishikawa 5603; along Hilo to Volcano Hwy at ca mile marker 18, small but growing naturalized population, 4 Apr 1985, L. Stemmermann 6931."
	Little Jr, E. L., Woodbury, R. O., & Wadsworth, F. H. (1974). Trees of Puerto Rico and the Virgin Islands. Second Volume. Agriculture Handbook 449, US Department of Agriculture, Washington, D.C.	[No evidence] "Rare in coastal swamps of moist coastal forest at sea level near Dorado in northern Puerto Rico." ... "RANGE.-Coastal plain of southeastern United States from Virginia to Florida including Florida Keys and Texas. Also Bahamas, Cuba, and Puerto Rico."

501	Aquatic	n
	Source(s)	Notes
	Wunderlin, R. P., & Poppleton, J. E. (1977). The Florida species of <i>Ilex</i> (Aquifoliaceae). <i>Florida Scientist</i> , 40(1), 7-21	[Terrestrial] " <i>Ilex cassine</i> var. <i>cassine</i> , commonly known as Dahoon, Dahoon Holly, or Christmas Berry, occurs in flatwood depressions and along edges of ponds and swamps from Virginia south to Florida and west to southeastern Texas. It also extends into the Caribbean area to the Bahamas and Cuba." ... "This variety, commonly referred to as Myrtle Dahoon, Myrtle-leaved Holly, or simply Myrtle Holly, occurs from North Carolina south to Florida and west to southwest Texas. Its habitat preference appears to be the same as that of var. <i>cassine</i> ."

502	Grass	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 21 Jun 2019]	Family: Aquifoliaceae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 21 Jun 2019]	Family: Aquifoliaceae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n

Qsn #	Question	Answer
	Source(s)	Notes
	Wunderlin, R. P., & Poppleton, J. E. (1977). The Florida species of <i>Ilex</i> (Aquifoliaceae). <i>Florida Scientist</i> , 40(1), 7-21	"Shrub or small tree to 12 m"

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 24 Jun 2019]	[No evidence in native or introduced range] "Native Northern America SOUTHEASTERN U.S.A.: United States [Alabama (s.), Florida, Georgia (s.), Louisiana, North Carolina (e.), South Carolina, Virginia (s.e.), Mississippi (s.)] SOUTH-CENTRAL U.S.A.: United States [Texas] SOUTHERN MEXICO: Mexico [Veracruz de Ignacio de la Llave] Southern America CARIBBEAN: Bahamas, Cuba, United States [Puerto Rico (n.e.)] Cultivated (also cult.)"

602	Produces viable seed	y
	Source(s)	Notes
	Gilman, E.F., Watson, D.G., Klein, R.W., Koeser, A.K., Hilbert, D.R. and McLean, D.C. (2018). <i>Ilex cassine</i> : Dahoon Holly. ENH458. UF/IFAS Extension, University of Florida, Gainesville, FL. https://edis.ifas.ufl.edu . [Accessed 24 Jun 2019]	"Propagation is by seeds, which germinate in one year, or by cuttings. Cuttings are preferred since they give plants of a known sex and also root easily."
	Hale, E. M. (1891). <i>Ilex cassine</i> : The aboriginal North American tea: its history, distribution, and use among the native American Indians. Bulletin No. 14. US Department of Agriculture, Division of Botany, Washington, D.C.	"This plant is raised from the seeds, which lie 2 years in the ground before it appears; it grows plentifully on many of the sand banks on the seashore of Carolina."

Qsn #	Question	Answer
603	Hybridizes naturally	y
	Source(s)	Notes
	Lady Bird Johnson Wildflower Center. (2019). <i>Ilex cassine</i> . https://www.wildflower.org . [Accessed 21 Jun 2019]	"Conditions Comments: Hybrids between this species and <i>I. opaca</i> occur naturally in the wild. Popular garden selections have been made from these hybrids."
	Wunderlin, R. P., & Poppleton, J. E. (1977). The Florida species of <i>Ilex</i> (Aquifoliaceae). <i>Florida Scientist</i> , 40(1), 7-21	" <i>Ilex</i> x <i>attenuata</i> Ashe is reported as a hybrid between <i>I. cassine</i> and <i>I. opaca</i> . It is reported from northwestern Florida, North Carolina, and South Carolina (Brizicky, 1964), but no specimens have been seen during this study. The few specimens seen and determined as <i>I. x attenuata</i> have been actually <i>f. cassine</i> var. <i>cassine</i> X var. <i>myrtifolia</i> or narrow leaved <i>I. cassine</i> var. <i>cassine</i> ."
	Manen, J. F., Barriera, G., Loizeau, P. A., & Naciri, Y. 2010. The history of extant <i>Ilex</i> species (Aquifoliaceae): Evidence of hybridization within a Miocene radiation. <i>Molecular Phylogenetics and Evolution</i> , 57(3): 961-977	"Three natural hybrids of <i>Ilex</i> have been analyzed in this study. <i>Ilex</i> x <i>attenuata</i> (<i>I. opaca</i> x <i>I. cassine</i> , Galle, 1997) is found to be close to <i>I. cassine</i> for the nuclear genes, and either to <i>I. cassine</i> or <i>I. cumulicola</i> for the chloroplast sequences (both relationships are equally well-supported)."

604	Self-compatible or apomictic	n
	Source(s)	Notes
	Little Jr, E. L., Woodbury, R. O., & Wadsworth, F. H. (1974). <i>Trees of Puerto Rico and the Virgin Islands</i> . Second Volume. Agriculture Handbook 449, US Department of Agriculture, Washington, D.C.	"Flowers on short hairy stalks at leaf bases in branching clusters (like cymes) to 1 inch long, male and female on different plants (dioecious)."
	Gilman, E.F., Watson, D.G., Klein, R.W., Koeser, A.K., Hilbert, D.R. and McLean, D.C. (2018). <i>Ilex cassine</i> : Dahoon Holly. ENH458. UF/IFAS Extension, University of Florida, Gainesville, FL. https://edis.ifas.ufl.edu . [Accessed 24 Jun 2019]	"Possessing male and female flowers on separate plants, at least two dahoon hollies (male and female) must be planted in the landscape to ensure production of the brilliant red berries in fall and winter."

605	Requires specialist pollinators	n
	Source(s)	Notes
	Zomlefer, W.B. 1994. <i>Guide to Flowering Plant Families</i> . The University of North Carolina Press, Chapel Hill & London	"The small and inconspicuous flowers of most hol-lies are entomophilous, although wind may aid in the pollination of some species (Brizicky 1964). Cross-pollination is reinforced by dioecism." [Aquifoliaceae family description]
	Plants for a Future. (2019). <i>Ilex cassine</i> . https://pfaf.org . [Accessed 21 Jun 2019]	"The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees. The plant is not self-fertile."

606	Reproduction by vegetative fragmentation	
	Source(s)	Notes
	Florida Native Plant Society. (2019). <i>Ilex cassine</i> . https://www.fnps.org/plants/plant/ilex-cassine . [Accessed 24 Jun 2019]	"Naturally clonal, so easily started from new offshoots." [Possibly Yes. No other sources report clonal]

Qsn #	Question	Answer
607	Minimum generative time (years)	>3
	Source(s)	Notes
	Cherrylake. (2019). Holly Dahoon Nativa - <i>Ilex cassine</i> 'Nativa' PPAF. https://cherrylake.com/holly_dahoon_nativa/ . [Accessed 24 Jun 2019]	"Growth Rate: 10 to 15 years to maturity" [Cultivar may not reflect time to maturity of wild type]
	Plants for a Future. (2019). <i>Ilex cassine</i> . https://pfaf.org . [Accessed 24 Jun 2019]	" <i>Ilex cassine</i> is an evergreen Tree growing to 10 m (32ft 10in) at a slow rate." [A slow growing shrub/small tree, probably takes 4 years or more to reach flowering at a minimum]

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	
	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.	" <i>Ilex cassine</i> L. has been planted along the highway from Hilo to Volcano on Hawai'i, and in Honolulu, O'ahu" [Potentially. Grown in heavily trafficked areas, but fruit and seeds lack means of external attachment]
	Floridata. (2019). <i>Ilex cassine</i> . https://floridata.com/plant/55 . [Accessed 24 Jun 2019]	"The dahoon's bright red berries attract hungry birds and other wildlife throughout the winter. They appear in fall just in time to play starring roles in Christmas wreaths and holiday arrangements." [Possibly. The seeds could be dispersed unintentionally via dried fruits on the wreaths].

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Gilman, E.F., Watson, D.G., Klein, R.W., Koeser, A.K., Hilbert, D.R. and McLean, D.C. (2018). <i>Ilex cassine</i> : Dahoon Holly. ENH458. UF/IFAS Extension, University of Florida, Gainesville, FL. https://edis.ifas.ufl.edu . [Accessed 24 Jun 2019]	"Attractive when tightly clipped into a tall screen or allowed to grow naturally into its single-trunked, small tree form, dahoon holly is ideal for a variety of landscape settings." [Ornamental and landscaping value]
	Imada, C. T., Staples, G. W. & Herbst, D. R. 2000. New Hawaiian plant records for 1999. Bishop Museum Occasional Papers 63: 9-16	"Dahoon holly has been cultivated in Hawai'i since the early 1940s (or earlier)"

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	Probably not. No evidence of the species being grown in or around seed crops. Also relatively large seeds.

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Mossman, R.E. (2009). Seed Dispersal and Reproduction Patterns Among Everglades Plants. PhD Dissertation. Florida International University, Miami, Florida	"Dispersal method: endozoochory + hydrochory"

Qsn #	Question	Answer
705	Propagules water dispersed	y
	Source(s)	Notes
	Mossman, R.E. (2009). Seed Dispersal and Reproduction Patterns Among Everglades Plants. PhD Dissertation. Florida International University, Miami, Florida	"Scientific name: <i>Ilex cassine</i> var. <i>cassine</i> Dispersal method: endozoochory + hydrochory Peak dispersal month(s): Sept.–Dec. Buoyancy (FD50): >30 days"

706	Propagules bird dispersed	y
	Source(s)	Notes
	Florida Native Plant Society. (2019). <i>Ilex cassine</i> . https://www.fnps.org/plants/plant/ilex-cassine . [Accessed 24 Jun 2019]	"Berries eaten by various bird species."
	Imada, C. T., Staples, G. W. & Herbst, D. R. 2000. New Hawaiian plant records for 1999. Bishop Museum Occasional Papers 63: 9-16	"This holly fits the profile for bird-dispersed plants with its abundant, rather fleshy, bright red fruits containing multiple seeds contained in a hard pit."

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Mossman, R.E. (2009). Seed Dispersal and Reproduction Patterns Among Everglades Plants. PhD Dissertation. Florida International University, Miami, Florida	"Dispersal method: endozoochory + hydrochory" [Adapted for frugivory and internal dispersal. Fruit & seeds lack means of external attachment]

708	Propagules survive passage through the gut	y
	Source(s)	Notes
	Gilman, E.F., Watson, D.G., Klein, R.W., Koeser, A.K., Hilbert, D.R. and McLean, D.C. (2018). <i>Ilex cassine</i> : Dahoon Holly. ENH458. UF/IFAS Extension, University of Florida, Gainesville, FL. https://edis.ifas.ufl.edu . [Accessed 24 Jun 2019]	"Possessing male and female flowers on separate plants, at least two dahoon hollies (male and female) must be planted in the landscape to ensure production of the brilliant red berries in fall and winter. The berries serve as an excellent food source for wildlife but are far less prevalent than on East palatka or Fosters holly."
	Titus, J. H. 1991. Seed bank of a hardwood floodplain swamp in Florida. <i>Castanea</i> , 56(2): 117-127	"The pattern of <i>Vitis rotundifolia</i> and <i>Rubus argustus</i> on stumps and other emergent microsites suggest that dispersal of fruits by animals which use emergent microsites in swamps to rest and defecate. Sample sizes are too small to discern if other animal dispersed plant species (<i>Ilex cassine</i> , <i>Myrica cerifera</i> and <i>Ampelopsis arborea</i>) fit this pattern."
	Imada, C. T., Staples, G. W. & Herbst, D. R. 2000. New Hawaiian plant records for 1999. Bishop Museum Occasional Papers 63: 9-16	[Presumably Yes] "This holly fits the profile for bird-dispersed plants with its abundant, rather fleshy, bright red fruits containing multiple seeds contained in a hard pit."

Qsn #	Question	Answer
801	Prolific seed production (>1000/m²)	n
	Source(s)	Notes
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"Fruit in stalked clusters, globose, 0.25-0.3 inches in diameter, red (or yellow), stones 1-4, ribbed" [Unlikely. Relatively large, few-seeded fruit]
	Mossman, R.E. (2009). Seed Dispersal and Reproduction Patterns Among Everglades Plants. PhD Dissertation. Florida International University, Miami, Florida	"Misc: Fruit right, seeds left (2/fruit)."

802	Evidence that a persistent propagule bank is formed (>1 yr)	y
	Source(s)	Notes
	Plants for a Future. (2019). <i>Ilex cassine</i> . https://pfaf.org . [Accessed 24 Jun 2019]	"Seed - best sown as soon as it is ripe in the autumn in a cold frame. It can take 18 months to germinate. Stored seed generally requires two winters and a summer before it will germinate and should be sown as soon as possible in a cold frame. Scarification, followed by a warm stratification and then a cold stratification may speed up the germination time[78, 80]."
	Hale, E. M. (1891). <i>Ilex cassine</i> : The aboriginal North American tea: its history, distribution, and use among the native American Indians. Bulletin No. 14. US Department of Agriculture, Division of Botany, Washington, D.C.	"This plant is raised from the seeds, which lie 2 years in the ground before it appears; it grows plentifully on many of the sand banks on the seashore of Carolina."

803	Well controlled by herbicides	
	Source(s)	Notes
	DiTomaso, J. M., Kyser, G. B., Oneto, et al. 2013. Weed Control in Natural Areas in the Western United States. Weed Research and Information Center, University of California, Davis, CA	[Possibly. Herbicides including 2,4-D, Glyphosate, Imazapyr, Picloram, Tebuthiuron, & Triclopyr listed as providing excellent control for the invasive holly <i>Ilex aquifolium</i> ']

804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	Source(s)	Notes
	Plants for a Future. (2019). <i>Ilex cassine</i> . https://pfaf.org . [Accessed 24 Jun 2019]	"Plants are very tolerant of pruning and can be cut right back into old wood if required[188]."
	Dirr, M.A. 2011. <i>Dirr's Encyclopedia of Trees and Shrubs</i> . Timber Press, Portland, OR	"Prune to maintain a dense habit."
	USDA Natural Resources Conservation Service. (2019). Conservation Plant Characteristics - <i>Ilex cassine</i> . https://plants.usda.gov/java/charProfile?symbol=ILCA . [Accessed 24 Jun 2019]	"Resprout Ability = Yes"

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes

Qsn #	Question	Answer
	<p>Imada, C. T., Staples, G. W. & Herbst, D. R. 2000. New Hawaiian plant records for 1999. Bishop Museum Occasional Papers 63: 9-16</p>	<p>[Unknown] "Dahoon holly has been cultivated in Hawai'i since the early 1940s (or earlier) but has not previously been found naturalized in the state. The following 2 collections document its existence outside of cultivation on 2 islands. Collectors are encouraged to seek it on others. This holly fits the profile for bird-dispersed plants with its abundant, rather fleshy, bright red fruits containing multiple seeds contained in a hard pit. Material examined: O'AHU: Whitmore Village, ca 0.5 mi above fence along dirt road, growing among eucalyptus and other exotics, about 25-30 plants seen, all size classes present, 16 Dec 1998, M. Keir 1. HAWAII: Puna Distr, land of 'Ola'a, along Hwy 11 to Volcano, 17.4 miles from Hilo, 1850 ft, 16 Dec 1975, D. Herbst & S. Ishikawa 5603; along Hilo to Volcano Hwy at ca mile marker 18, small but growing naturalized population, 4 Apr 1985, L. Stemmermann 6931."</p>

Summary of Risk Traits:

High Risk / Undesirable Traits

- Broad climate suitability
- Grows in regions with tropical climates
- Naturalized on Oahu, and Hawaii (Hawaiian Islands)
- Other *Ilex* species are invasive
- May be slightly toxic
- Shade tolerant (could potentially spread into intact forests)
- Tolerates many soil types
- Reproduces by seeds, and possibly clonally
- Hybridizes with other *Ilex* species
- Seeds dispersed by birds, water and intentionally by people
- Seeds may remain viable in soil for two years
- Able to resprout after cutting and pruning

Low Risk Traits

- Unarmed (no spines, thorns, or burrs)
- Palatable to livestock (but palatability is reported to be low)
- Valued as an ornamental tree
- Dioecious, requiring male and female trees for reproduction
- Reaches maturity 4+ years