Taxon: Vitis vinifera L. **Family:** Vitaceae

Common Name(s): common grapevine
European grape
grape
grapevine

Synonym(s): Cissus vinifera (L.) Kuntze
Vitis sylvestris C.C. Gmel.
Vitis vinifera subsp. sativa Hegi
Vitis vinifera subsp. sylvestris (Willd.)

Assessor: Chuck Chimera **Status:** Assessor Approved **End Date:** 2 Aug 2021

WRA Score: 0.0 **Designation:** L **Rating:** Low Risk

Keywords: Liana, Naturalized Elsewhere, Climbing, Self-Fertile, Bird-Dispersed

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	y
102	Has the species become naturalized where grown?	y=1, n=-1	y
103	Does the species have weedy races?	y=1, n=-1	n
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)	Intermediate
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	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		
303	Agricultural/forestry/horticultural weed		
304	Environmental weed		
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	y
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals	y=1, n=-1	n
405	Toxic to animals	y=1, n=0	n
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n

Qsn #	Question	Answer Option	Answer
409	Is a shade tolerant plant at some stage of its life cycle		
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	y
412	Forms dense thickets		
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	y
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
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	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)		
803	Well controlled by herbicides	y=-1, n=1	y
804	Tolerates, or benefits from, mutilation, cultivation, or fire		
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

Supporting Data:

Qsn #	Question	Answer
101	**Is the species highly domesticated?**	**y**
	Source(s)	**Notes**
	Hickey, M. & King, C. (1988). 100 Families of Flowering Plants. Cambridge University Press, Cambridge, UK	"Distribution. V. vinifera is known to have been in cultivation for some 6000 years and it is difficult to ascertain its complete ancestry and correct wild distribution."

102	**Has the species become naturalized where grown?**	**y**
	Source(s)	**Notes**
	Hickey, M. & King, C. (1988). 100 Families of Flowering Plants. Cambridge University Press, Cambridge, UK	"It is considered that the cultivated clones probably originated in S.W. Asia and in some areas have become naturalised, forming hybrids with ssp. sylvestris."
	Hosking, J. R., Conn, B. J., & Lepschi, B. J. (2003). Plant species first recognised as naturalised for New South Wales over the period 2000–2001. Cunninghamia, 8(2): 175-187	"Vitis vinifera has naturalised in Western Australia (PERTH specimen) and Victoria (MEL specimen). Vitis vinifera s. lat. is also naturalised in New Zealand and naturalised taxa under this name also vary in a number of characters (Sykes in Webb et al. 1988)."

103	**Does the species have weedy races?**	**n**
	Source(s)	**Notes**
	de Jauregui, R. (2019). Differences Between Wild Grape Vines & Domesticated Vines. https://homeguides.sfgate.com/differences-between-wild-grape-vines-domesticated-vines-29825.html. [Accessed 30 Jul 2021]	[Wild grapes or hybrids may become invasive] "Wild grapes (Vitis spp.) were found by European settlers when they arrived on the East Coast of what is now the United States. Accustomed to the domesticated grapes (Vitis vinifera) native to Europe, the rampant vines and fruits of the wild grapes encouraged grape connoisseurs to hybridize various species to produce larger, sweeter fruits for wine, juice and jellies. While a few native wild grapes have been cultivated, most domesticated grapes are vinifera cultivars." ... "North America holds approximately one-half of the world's grape species. In some areas, they are considered invasive weeds. The vines grow up and over trees, covering the canopy and blocking light from the leaves. The lack of light can reduce the tree's ability to photosynthesize and slow its growth. In winter, the weight of the snow- and ice-covered vines can bend and break the tree's branches."

201	**Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"**	**Intermediate**
	Source(s)	**Notes**

Qsn #	Question	Answer
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 29 Jul 2021]	"Native Africa NORTHERN AFRICA: Algeria, Morocco, Tunisia Asia-Temperate WESTERN ASIA: Iran, Iraq, Israel, Syria, Turkey CAUCASUS: Russian Federation-Ciscaucasia [Ciscaucasia], Armenia, Azerbaijan, Georgia, Russian Federation [Dagestan] MIDDLE ASIA: Turkmenistan Europe MIDDLE EUROPE: Czechoslovakia, Austria, Switzerland, Germany, Hungary EASTERN EUROPE: Moldova, Ukraine (incl. Krym) SOUTHEASTERN EUROPE: Former Yugoslavia, Albania, Bulgaria, Greece, Italy (incl. Sardinia, Sicily), Romania SOUTHWESTERN EUROPE: France (incl. Corsica)"
	Lim, T.K. (2013). Edible Medicinal And Non-Medicinal Plants. Volume 6, Fruits. Springer, Dordrecht	"Vitis vinifera is native to the Mediterranean region, central Europe, and Asia minor, from Portugal north to southern Germany and east to northern Iran. It is cultivated on every continent except for Antarctica."

202	Quality of climate match data	High
	Source(s)	**Notes**
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 29 Jul 2021]	

203	Broad climate suitability (environmental versatility)	n
	Source(s)	**Notes**
	Lim, T.K. (2013). Edible Medicinal And Non-Medicinal Plants. Volume 6, Fruits. Springer, Dordrecht	"Being a Mediterranean species, V. vinifera has a requirement for a long, warm to hot dry summers and mild winters. It thrives in areas with annual temperature of 8.3–28.5°C and annual precipitation of 900–2,700 mm, falling mainly in the winter months. Frost kill young shoots and the plant is intolerant of high temperature and high humidity that promotes diseases. Grapes are predominantly grown between 20 and 50°N and from 20 to 40°S but can be grown in the tropics at cooler high altitudes. Grape culture is best where there is no rain between blooming and harvesting and several irrigations may be necessary."

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	**Notes**
	Lim, T.K. (2013). Edible Medicinal And Non-Medicinal Plants. Volume 6, Fruits. Springer, Dordrecht	"Grapes are predominantly grown between 20 and 50°N and from 20 to 40°S but can be grown in the tropics at cooler high altitudes."

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.	"Several forms of Vitis vinifera are cultivated in Hawai'i and may persist after cultivation."
	Frohlich, D. & Lau, A. (2012). New plant records for the Hawaiian islands. Bishop Museum Occasional Papers 113: 27–54	[Adventive, and possibly naturalized on Kauai, and Hawaii islands] "Vitis vinifera L. Specimens of this species have been collected on Hawai'i island which mention adventive status or growing in areas well away from cultivation. A specimen identified as either V. vinifera or a hybrid involving that species (as V. vinifera vel. aff.) was also found growing along a roadside, well away from cultivated settings, in Kōke'e, Kaua'i. Material examined. KAUA'I: Along Halemanu stream, near Waipo'o Falls trail. Sprawling to 15 ft over top of Corynocarpus laevigatus in mixed alien roadside vegetation. Fruits immature, 25 Jun 2010, D. Frohlich & A. Lau 2010062503. HAWAI'I: Kona–Ka'ū Boundary, adventive at roadside, 25 Jul 1926, O. Degener 30,255; Kīlauea iki trail. A grape-like vine growing near the bottom east side, Kīlauea iki. 3 Aug 1943, A.L.M. Mitchell 704."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	[Vitis vinifera] "Preferred Climate/s: Mediterranean, Subtropical, Tropical"

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	**Notes**
	Flora of North America Editorial Committee. (2016). Flora of North America North of Mexico. Volume 12. Magnoliophyta: Vitaceae to Garryaceae. Oxford University Press, New York and Oxford	"Europe; introduced widely. "
	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	"In Hawai'i, wine grapes are grown commercially on Maui; in the past, small vineyards existed, mostly near Hilo."
	Lim, T.K. (2013). Edible Medicinal And Non-Medicinal Plants. Volume 6, Fruits. Springer, Dordrecht	"Vitis vinifera is native to the Mediterranean region, central Europe, and Asia minor, from Portugal north to southern Germany and east to northern Iran. It is cultivated on every continent except for Antarctica."

301	Naturalized beyond native range	y
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Several forms of Vitis vinifera are cultivated in Hawai'i and may persist after cultivation."

Qsn #	Question	Answer
	Hosking, J. R., Conn, B. J., & Lepschi, B. J. (2003). Plant species first recognised as naturalised for New South Wales over the period 2000–2001. Cunninghamia, 8(2): 175-187	"Vitis vinifera was not considered to be naturalised at the time that Harden (1992) was published but recent records suggest that it has naturalised although only weakly so at present. To date only known from single plants at each location but likely to be scattered elsewhere. Spread by bird-dispersed seed. Vitis vinifera has naturalised in Western Australia (PERTH specimen) and Victoria (MEL specimen). Vitis vinifera s. lat. is also naturalised in New Zealand and naturalised taxa under this name also vary in a number of characters (Sykes in Webb et al. 1988)."
	Frohlich, D. & Lau, A. (2012). New plant records for the Hawaiian islands. Bishop Museum Occasional Papers 113: 27–54	[Adventive, and possibly naturalized on Kauai, and Hawaii islands] "Vitis vinifera L. Specimens of this species have been collected on Hawai'i island which mention adventive status or growing in areas well away from cultivation. A specimen identified as either V. vinifera or a hybrid involving that species (as V. vinifera vel. aff.) was also found growing along a roadside, well away from cultivated settings, in Kōke'e, Kaua'i. Material examined. KAUA'I: Along Halemanu stream, near Waipo'o Falls trail. Sprawling to 15 ft over top of Corynocarpus laevigatus in mixed alien roadside vegetation. Fruits immature, 25 Jun 2010, D. Frohlich & A. Lau 2010062503. HAWAI'I: Kona–Ka'ū Boundary, adventive at roadside, 25 Jul 1926, O. Degener 30,255; Kīlauea iki trail. A grape-like vine growing near the bottom east side, Kīlauea iki. 3 Aug 1943, A.L.M. Mitchell 704."
	Webb, C. J., Sykes, W. R., & Garnock-Jones, P. J. (1988). Flora of New Zealand Volume IV. Botany Division, DSIR, Christchurch, New Zealand	[Naturalized in New Zealand] "N.: N. Auckland, Auckland, Coromandel Peninsula, Bay of Plenty, Hawke's Bay; S.: Karamea (Buller County), Christchurch, Timaru; K.: Raoul Id. Around old gardens and rubbish dumps, sometimes on roadsides."

302	Garden/amenity/disturbance weed	
	Source(s)	**Notes**
	Missouri Botanical Garden. (2021). Vitis vinifera. http://www.missouribotanicalgarden.org. [Accessed 2 Aug 2021]	"Invasive: Where is this species invasive in the US? Garden locations" [No further details of negative impacts provided]
	WRA Specialist. (2021). Personal Communication	Unclear. Many invasive or weedy Vitis plants may be hybrids or wild relatives rather than cultivars of Vitis vinifera

303	Agricultural/forestry/horticultural weed	
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	Included in citations of crop weeds, but a subsequent review of the publications did not confirm or identify any detrimental impacts of grapes on crops or agriculture.

304	Environmental weed	
	Source(s)	**Notes**

Qsn #	Question	Answer
	Verloove, F. (2021) Vitis vinifera. On: Manual of the Alien Plants of Belgium. Botanic Garden Meise, Belgium. alienplantsbelgium.be	"Vitis vinifera L. (Euras.) – A rare but increasing escape from or relic of cultivation.Probably first collected in 1869 in a quarry in Vaulx-lez-Tournai (but rather doubtfully wild there; according to some sources introduced there ages ago by the Romans, see Durand 1899). In this vicinity Vitisvinifera is still present today (as seen in 2011). In the past decades furthermore recorded in rather numerous, widely scattered locations. Many records are from urban or other disturbed habitats (rough ground near houses, dumps, etc.) but some are from rather remote and more natural sites (for instance in abandoned quarries, woodland, rocks, etc.). Belgian records of Vitis vinifera seem to have a double or triple origin. Records in urban habitats (pavement, basement walls) obviously originate from thrown away pits (cf. Eriobotrya japonica and Ficus carica). Other records probably represent relics of former cultivation (Vitis vinifera often builds massive stands and it is sometimes difficult to assess whether or not a clone is wild or cultivated). Finally, records in rather remote localities (for instance in an abandoned quarry in Ecaussines) are most likely birdsown. At least in some places Vitis vinifera seems to have become naturalized lately. In Ecaussines a doubtlessly wild population was found with large amounts of ripe fruits in 2011"
	Webb, C. J., Sykes, W. R., & Garnock-Jones, P. J. (1988). Flora of New Zealand Volume IV. Botany Division, DSIR, Christchurch, New Zealand	"Wild grapes form dense tangled thickets and climb to c. 15 m high on trees; they mainly or solely spread by copious stem layers. In cultivation such rampant growth is usually checked by annual pruning." [Unclear if wild grapes are hybrids or true Vitis vinifera]
	West, C. J., & Thompson, A. M. (2013). Small, dynamic and recently settled: responding to the impacts of plant invasions in the New Zealand (Aotearoa) archipelago. Pp. 285-311 In Foxcroft et al. (eds.). Plant Invasions in Protected Areas. Springer, Dordrecht	[Grapes anticipated to spread following rat eradication on Raoul Island, Kermadecs, were themselves targeted for removal] "Eradication of rats enabled greater recruitment of many native plant species, as it did for a number of IAPs. Indeed, many IAPs that did not fruit in the presence of rats began to fruit and recruit seedlings for the first time, e.g. Hibiscus tiliaceus (fou), Catharanthus roseus (rosy periwinkle) and Bryophyllum pinnatum (airplant; West and Havell 2011). However, this outcome was anticipated and Vitis vinifera (grape), the species most likely to spread, was targeted for eradication before the rat eradication was undertaken (West 2011)."
	West, C.J. (2011). Consideration of rat impacts on weeds prior to rat and cat eradication on Raoul Island, Kermadecs. Pp. 244-247 In: Veitch, C. R.; Clout, M. N. and Towns, D. R. (eds.). Island invasives: eradication and management. IUCN, Gland, Switzerland	[Potentially. Grapes were anticipated to become invasive following removal of rats from Raoul Island, Kermadeces, and were targeted for eradication] "Some studies have indicated that exotic plants can become invasive after herbivore or seed predator removal (Caut et al. 2009; Zavaleta et al. 2001; Abbott et al. 2000). These effects were anticipated on Raoul Island and the exotic flora was scrutinised for species that could change their status following rat and cat eradication. Just three species were identified that warranted eradication prior to the mammal eradication operation. Despite grapes not being recorded as an invasive species outside of North America (Reichard 1994), this species possessed sufficient characteristics (Buckley et al. 2006) to indicate it could become a widespread transformer once it was released from suppression by rat predation and available for dispersal by native and exotic birds which were also released from predation by rats and cats."

Qsn #	Question	Answer
	Brundu, G. (2013). Invasive alien plants in protected areas in Mediterranean islands: Knowledge Gaps and Main Threats. In Plant Invasions in Protected Areas (pp. 395-422). Springer, Dordrecht	[Targeted for eradication in a protected area on Malta. No details of negative impacts provided] "In Malta, according to a national report (MEPA 2004) a number of invasive species are being earmarked from removal from a number of PAs. Preliminary efforts have been undertaken, or are on-going, and are aimed at controlling the spread in the Maltese Islands of Carpobrotus edulis from sand dunes, Arundo donax and Vitis vinifera (common grape vine) from Ir-Ramla l-Ħamra, A. saligna from Għajn Tuffieħa (western coast of the island of Malta), Agave spp. from Rdum tal-Madonna. Other species being active managed on Malta are Ricinus communis and various Opuntia spp."

305	Congeneric weed	y
	Source(s)	**Notes**
	de Jauregui, R. (2019). Differences Between Wild Grape Vines & Domesticated Vines. https://homeguides.sfgate.com/differences-between-wild-grape-vines-domesticated-vines-29825.html. [Accessed 2 Aug 2021]	"North America holds approximately one-half of the world's grape species. In some areas, they are considered invasive weeds. The vines grow up and over trees, covering the canopy and blocking light from the leaves. The lack of light can reduce the tree's ability to photosynthesize and slow its growth. In winter, the weight of the snow- and ice-covered vines can bend and break the tree's branches. Wild grapes produce fruit ranging from 1/8- to 1-inch in diameter in bunches or clusters of four to 10 fruits. While the fruits are edible, they vary from acidic to sweet. Though humans may not find some species of wild grapes tasty, birds and other wildlife enjoy the fruits when they're fresh and after they've dried on the vines in winter."
	Laguna, E. (2004). American and hybrid grapevines (Vitis spp.): A new concept of invasive plants to Europe. In 4th European Conference on the Conservation of the Wild Plants.–A workshop on the implementation of the Global Strategy for Plant Conservation in Europe, Valencia, Spain	"V. vinifera subsp. sylvestris seems to be an extint species in most part of the Western Mediterranean area -but never appearing in red listsį. Simultanoeusly, the invasive non-native or artificially created hybrids of grapevines, are becoming the most abundant invasive ligneous species –being nowadays more widespreaded than classical invaders such as Ailanthus altissima, Acer negundo, Robinia pseudoaccacia, etc"
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	Several other species of Vitis have been cited as being naturalized and/or weeds

401	Produces spines, thorns or burrs	n
	Source(s)	**Notes**

Qsn #	Question	Answer
	Lim, T.K. (2013). Edible Medicinal And Non-Medicinal Plants. Volume 6, Fruits. Springer, Dordrecht	[No evidence] "A vigorous, climbing woody, deciduous, perennial liana up to 15–20 m long (Plates 1 , 9), but in cultivation drastically pruned to 1.5–3 m. Branchlets are terete, with longitudinal ridges, glabrous or sparsely pilose with branched tendrils. Leaves are simple, green, alternate; stipules caducous; petioles 4–9 cm and nearly glabrous; leaf blade circular to circular-ovate in outline, conspicuously 3–5-lobed or cleft, 7–18 cm by 6–16 cm, basal veins 5, lateral veins 4 or 5 pairs, base deeply cordate, margin irregularly serrate to dentate (Plates 1 , 2 , 9 , 10). Panicle sparse or dense, opposite to leaves, basal branches well developed, 10–20 cm; peduncle 2–4 cm, glabrous or with sparse tomentum. Flower bisexual or functionally pistillate with shorter sterile stamens, greenish in colour. Calyx very shortly 5-lobed glabrous, undulate; petals 5, lanceolate, about 5 mm, pale green, sweet-scented; filaments filiform, 0.6–1 mm; anthers yellow, oval, 0.4–0.8 mm; pistil aborted in male flowers; ovary oval; style short; stigma expanded. Fruit a berry, ellipsoid to globose, 6–25 mm diameter, with soft skin adhering to the pulp, dark blue-purple, black, red, green or yellow, juicy, sweet or sour , seeded or seedless (Plates 1 – 10). Seeds 2–3, obovoid to pyriform, apex subrounded."

402	Allelopathic	
	Source(s)	**Notes**
	Ahmed, S. A., Messiha, N. K., Ei-Masry, R. R., & Ei-Rokiek, K. G. (2012). Allelopathic potentiality of the leaf powder of Morus alba and Vitis vinifera on the growth and propagative capacity of purple nutsedge (Cyperus rotundus L.) and maize (Zea mays L.). Journal of Applied Sciences Research, 2012: 4744-4751	[Possibly. Extracts demonstrate allelopathic effects in laboratory experiments] "Abstract : Two pot experiments were conducted during two successive summer seasons of 2010 and 2011 in the greenhouse of National Research Centre, Egypt to study the effect of incorporating Morus alba and Vitis vinifera leaf powder to the soil on the growth and propagative capacity of purple nutsedge as well as maize plants. The experiment included soil treatments with Morus alba and Vitis vinifera leaf powder at the rate of 0, 25, 50 and 75 g/kg soil. Generally, in the 1st stage of growth 45 days after sowing (DAS)*, all concentrations used of both Morus alba and Vitis vinifera significantly inhibited to high extent the growth of foliage as well as the underground organs and the dry weight of purple nutsedge. In the 2nd stage of growth (75 DAS) complete eradication was recorded with all concentrations except the low concentrations of both M. alba and V. vinifera. The total phenolic contents in foliage and underground organs of purple nutsedge were significantly increased by increasing the concentrations of both materials used. On the other hand, all treatments applied caused significant increase in the growth characters and total carbohydrate contents of maize comparing to the corresponding controls. Maximum increase was recorded with the highest concentration of V. vinifera. Results suggested that both M. alba and V. vinifera leaves could be used as safety tools to suppress purple nutsedge growth and stimulate maize growth."

403	Parasitic	n
	Source(s)	**Notes**

Qsn #	Question	Answer
	Flora of North America Editorial Committee. (2016). Flora of North America North of Mexico. Volume 12. Magnoliophyta: Vitaceae to Garryaceae. Oxford University Press, New York and Oxford	"Plants sprawling to moderately high climbing, sparsely branched." [No evidence]

404	Unpalatable to grazing animals	n
	Source(s)	**Notes**
	Abrol, D.P. (2015). Pollination Biology, Vol.1: Pests and Pollinators of Fruit Crops. Springer International Publishing, Switzerland	"Vine-grazing pests include many species of deer and rabbits. They do not usually consume significant amounts of plant in a healthy vineyard, but are particularly damaging in newly planted vineyards. They can defoliate vines in a new planting, eating the tender leaf blades while leaving the petioles still attached to the shoots. This can greatly delay the establishment of young vines through the loss of photosynthetic capacity. Rabbits, turkeys and other animals can also eat the bark from the young trunks, damaging or even killing vines."
	Papageorgiou, N., Neophytou, C., Spais, A., & Vavalekas, C. (1981). Food Preferences, and Protein and Energy Requirements for Maintenance of Roe Deer. The Journal of Wildlife Management, 45(3), 728-733	[Grapes are among the preferred browse plants of Roe deer] "During the feeding trial, roe deer used, in descending order of preference: Ononis spinosa, Rubus ulmifolius, Ulmus carpinifolia, Cornus mass, Rubus hirtus, Ostrya carpinifolia, Corylus avellana, Caprinus orientalis, Coronilla varia, Robinia pseudoacacia, Salix purpurea, Trifolium angustifolium, Vitis vinifera, Fraxinus ornus, Acer campestre, Chondrilla juncea, and Quercus pubescens (Table 1). These species were the preferred forage species in the normal diet of roe deer during the summer."
	Romero, M. J., Madrid, J., Hernandez, F., & Ceron, J. J. (2000). Digestibility and voluntary intake of vine leaves (Vitis vinifera L.) by sheep. Small Ruminant Research, 38 (2), 191-195	[Palatable, but with low digestibility for sheep] "It is concluded that the low digestibility of the vine leaves might be due to factors such as the high levels of lignin and condensed tannins, and low protein digestibility. However, this by-product was accepted by sheep and toxic effect was not evidenced in this study."

Qsn #	Question	Answer
405	**Toxic to animals**	**n**
	Source(s)	**Notes**
	Plants for a Future. (2021). Vitis vinifera. https://pfaf.org. [Accessed 2 Aug 2021]	"Known Hazards: None known"
	Lim, T.K. (2013). Edible Medicinal And Non-Medicinal Plants. Volume 6, Fruits. Springer, Dordrecht	"Residue from pressed grapes is used as livestock feed or used to make tannin and cream of tartar."
	Papageorgiou, N., Neophytou, C., Spais, A., & Vavalekas, C. (1981). Food Preferences, and Protein and Energy Requirements for Maintenance of Roe Deer. The Journal of Wildlife Management, 45(3), 728-733	[Grapes are among the preferred browse plants of Roe deer] "During the feeding trial, roe deer used, in descending order of preference: Ononis spinosa, Rubus ulmifolius, Ulmus carpinifolia, Cornus mass, Rubus hirtus, Ostrya carpinifolia, Corylus avellana, Caprinus orientalis, Coronilla varia, Robinia pseudoacacia, Salix purpurea, Trifolium angustifolium, Vitis vinifera, Fraxinus ornus, Acer campestre, Chondrilla juncea, and Quercus pubescens (Table 1). These species were the preferred forage species in the normal diet of roe deer during the summer."
	Quattrocchi, U. (2012). CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence

406	Host for recognized pests and pathogens	
	Source(s)	**Notes**
	Missouri Botanical Garden. (2021). Vitis vinifera. http://www.missouribotanicalgarden.org. [Accessed 2 Aug 2021]	"Grapes grown for fruit production are high maintenance plants that require regular pruning and ongoing attention to insect and disease pests. Grapes are susceptible to a large number of diseases, particularly in humid summer climates such as Missouri, including anthracnose, black rot, downy and powdery mildew, phomopsis, gray mold, crown gall, Pierce's disease, various virus diseases and botrytis bunch rot. Insect pests include phylloxera, grape berry moth, Japanese beetle, leaf hopper, leaf roller, mealy bugs and flea beetles. "
	Love, K. and Paull, R. E. (2014). Growing Grapes in Hawai'i. F_N-26. CTAHR, University of Hawai'i at Mānoa, Honolulu, HI	"Pests and Diseases Knowing the diseases that affect grapes in the tropics is essential for high-quality fruit production. It's good to be aware of these diseases before planting. An area with more winds and low humidity will have fewer problems than areas with high humidity and little air flow through the vines." [Includes Powdery Mildew (Erysiphe spp. and Sphaerotheca spp.), Downy Mildew (Plasmopara viticola), Trunk Canker (Botryoshaeria spp.), An aphid-like insect, Daktulosphaira vitifoliae] ... "There are numerous other diseases, insects, mites, and nematodes that can affect grape vines."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	**Notes**
	Plants for a Future. (2021). Vitis vinifera. https://pfaf.org. [Accessed 2 Aug 2021]	"Known Hazards: None known"

Qsn #	Question	Answer
	Lim, T.K. (2013). Edible Medicinal And Non-Medicinal Plants. Volume 6, Fruits. Springer, Dordrecht	[No evidence] "Fruits are eaten fresh or dried, processed into raisins, pressed for juice, fermented as wine, or made into jams and jellies. Grape seeds contained 6–20% oil which is edible and can be sued for cooking. Young leaves are eaten as a vegetable. Grape leaves are a popular ingredient in many cuisines in the Middle East including Armenian, Turkish, Egyptian, Algerian, Syrian, Lebanese and Albanian and Greek."
	Quattrocchi, U. (2012). CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	**Notes**
	Lim, T.K. (2013). Edible Medicinal And Non-Medicinal Plants. Volume 6, Fruits. Springer, Dordrecht	"Being a Mediterranean species, V. vinifera has a requirement for a long, warm to hot dry summers and mild winters. It thrives in areas with annual temperature of 8.3–28.5°C and annual precipitation of 900–2,700 mm, falling mainly in the winter months." [Grapes grow or are cultivated in fire prone ecosystems, but there is no evidence that they contribute to increased fire risk]
	Chelan/Douglas County Master Gardener Program. (2017). Fire Resistant Plants for Chelan and Douglas Counties of Washington. WSU Extension,	Vitis vinifera 'Purpurea' Purpleleaf grape included among a list of fire resistant plants

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	**Notes**
	Plants for a Future. (2021). Vitis vinifera. https://pfaf.org. [Accessed 2 Aug 2021]	" It can grow in semi-shade (light woodland) or no shade. "
	Love, K. and Paull, R. E. (2014). Growing Grapes in Hawai'i. F_N-26. CTAHR, University of Hawai'i at Mānoa, Honolulu, HI	"Full sun exposure is needed, though direct sun exposure onto fruit is to be avoided."
	Missouri Botanical Garden. (2021). Vitis vinifera. http://www.missouribotanicalgarden.org. [Accessed 2 Aug 2021]	"Sun: Full sun"

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	**Notes**
	Missouri Botanical Garden. (2021). Vitis vinifera. http://www.missouribotanicalgarden.org. [Accessed 2 Aug 2021]	"Best grown in deep, loamy, humus-rich, medium moisture, well-drained soils in full sun. Performs well in gravelly loams. Tolerates a wide range of soil conditions, including average garden soils, but must have good drainage."
	Lim, T.K. (2013). Edible Medicinal And Non-Medicinal Plants. Volume 6, Fruits. Springer, Dordrecht	"Grapes prefer sandy or gravelly soils where drainage is good. It grows best in deep, fertile, well-drained soil that has a pH of between 5.5 and 7.0. Presence of excess salts particularly sodium and free calcium is detrimental for grapes."

Qsn #	Question	Answer
411	**Climbing or smothering growth habit**	**y**
	Source(s)	**Notes**
	Lim, T.K. (2013). Edible Medicinal And Non-Medicinal Plants. Volume 6, Fruits. Springer, Dordrecht	"A vigorous, climbing woody, deciduous, perennial liana up to 15–20 m long (Plates 1 , 9), but in cultivation drastically pruned to 1.5–3 m."
	Flora of North America Editorial Committee. (2016). Flora of North America North of Mexico. Volume 12. Magnoliophyta: Vitaceae to Garryaceae. Oxford University Press, New York and Oxford	"Plants sprawling to moderately high climbing, sparsely branched."
	Webb, C. J., Sykes, W. R., & Garnock-Jones, P. J. (1988). Flora of New Zealand Volume IV. Botany Division, DSIR, Christchurch, New Zealand	"Wild grapes form dense tangled thickets and climb to c. 15 m high on trees; they mainly or solely spread by copious stem layers. In cultivation such rampant growth is usually checked by annual pruning."

412	**Forms dense thickets**	
	Source(s)	**Notes**
	Webb, C. J., Sykes, W. R., & Garnock-Jones, P. J. (1988). Flora of New Zealand Volume IV. Botany Division, DSIR, Christchurch, New Zealand	[Potentially, although unclear if wild grapes are hybrids or cultivated V. vinifera] "Wild grapes form dense tangled thickets and climb to c. 15 m high on trees; they mainly or solely spread by copious stem layers. In cultivation such rampant growth is usually checked by annual pruning. Almost certainly, grapes grow wild to a minor extent in many other areas in addition to those listed above. Probably all or most wild grapes have rather small black frs, whereas in cultivation the frs are often larger and may be green or yellow. Presumably such wild plants correspond to one or more cvs introduced last century. The above description is based on wild plants and persistent relics in old gardens. Some of these plants probably represent hybrids of V. vinifera with at least 2 N. American spp."

501	**Aquatic**	**n**
	Source(s)	**Notes**
	Flora of North America Editorial Committee. (2016). Flora of North America North of Mexico. Volume 12. Magnoliophyta: Vitaceae to Garryaceae. Oxford University Press, New York and Oxford	[Terrestrial] "Riparian areas, disturbed sites; 0–1200 m"

502	**Grass**	**n**
	Source(s)	**Notes**
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 29 Jul 2021]	Subgenus: Vitis Family: Vitaceae Subfamily: Vitoideae

503	**Nitrogen fixing woody plant**	**n**

Qsn #	Question	Answer
	Source(s)	**Notes**
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 29 Jul 2021]	Subgenus: Vitis Family: Vitaceae Subfamily: Vitoideae

504	**Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)**	**n**
	Source(s)	**Notes**
	Lim, T.K. (2013). Edible Medicinal And Non-Medicinal Plants. Volume 6, Fruits. Springer, Dordrecht	"A vigorous, climbing woody, deciduous, perennial liana up to 15–20 m long (Plates 1 , 9), but in cultivation drastically pruned to 1.5–3 m."

601	**Evidence of substantial reproductive failure in native habitat**	**n**
	Source(s)	**Notes**
	Lim, T.K. (2013). Edible Medicinal And Non-Medicinal Plants. Volume 6, Fruits. Springer, Dordrecht	"Vitis vinifera is native to the Mediterranean region, central Europe, and Asia minor, from Portugal north to southern Germany and east to northern Iran. It is cultivated on every continent except for Antarctica." [No evidence]

602	**Produces viable seed**	**y**
	Source(s)	**Notes**

Qsn #	Question	Answer
	Orsenigo, S., Ardenghi, N. M. G., Vagge, I., Cauzzi, P., Müller, J. V., & Mondoni, A. (2017). Comparative seed germination study across alien grapes (Vitis, Vitaceae) in Europe. Weed Research, 57(6), 372-381	"Alien grape (Vitis, Vitaceae) species and recently described hybrids are recognised as major environmental weeds in southern Europe, based on their tendency to spread into natural and semi-natural habitats, often behaving as invasive species. Despite a high number of agronomic, genetic and phytopathological studies on Vitis cultivars, regeneration from seed has been poorly investigated, although it plays a key role in plant distribution and evolution. To this end, in this study we exposed seeds of eight wild grapes in Europe (three species and five nothospecies, including the native Vitis vinifera), to different temperature treatments in the laboratory. Fresh seeds from all studied taxa were dormant and germinated only after cold and/or warm plus cold stratification, but showing significant differences between the species. Seeds of V. vinifera showed an intermediate complex morphophysiological dormancy, while all other tested Vitis taxa exhibited a deep complex morphophysiological dormancy. Dark conditions reduced the germination percentage in Vitis labrusca, Vitis riparia and V. vinifera and their hybrids, and alternating temperatures elicited the highest germination percentages in all populations. Our results demonstrated for the first time that Vitis hybrids are capable of regeneration by seed, even in the absence of dispersal by animals. The germination processes studied here help understand the current expansion of alien Vitis taxa in Europe outside the viticultural areas. Consequently, germination requirements contribute to a better understanding of the mechanisms underlying alien Vitis taxa establishment and invasion."
	Plants for a Future. (2021). Vitis vinifera. https://pfaf.org. [Accessed 2 Aug 2021]	"Propagation - Seed - best sown in a cold frame as soon as it is ripe [K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering."
	Dangl, G. S., Mendum, M. L., Yang, J., Walker, M. A., & Preece, J. E. (2015). Hybridization of cultivated Vitis vinifera with wild V. californica and V. girdiana in California. Ecology and Evolution, 5(23), 5671-5684	"Under cultivation, V. vinifera seed production is primarily through selfing and results in very high inbreeding depression; such seeds produce very few normal, vital seedlings."

603	Hybridizes naturally	y
	Source(s)	**Notes**

Qsn #	Question	Answer
	Dangl, G. S., Mendum, M. L., Yang, J., Walker, M. A., & Preece, J. E. (2015). Hybridization of cultivated Vitis vinifera with wild V. californica and V. girdiana in California. Ecology and Evolution, 5(23), 5671-5684	"We did find that introgression of V. vinifera alleles into V. californica is pervasive; the same is likely true for V. girdiana. Introgression of V. vinifera alleles may place the natives in danger of genetic swamping. We identified first-generation V. californica 9 V. vinifera and V. girdiana 9 V. vinifera hybrids, and we document V. californica 9 V. vinifera backcrosses. Genetic erosion may also threaten the native populations as their habitat is lost or diminished, reducing the number of individuals and further isolating the naturally somewhat disjunct native populations."

604	Self-compatible or apomictic	y
	Source(s)	**Notes**
	de Jauregui, R. (2019). Differences Between Wild Grape Vines & Domesticated Vines. https://homeguides.sfgate.com/differences-between-wild-grape-vines-domesticated-vines-29825.html. [Accessed 2 Aug 2021]	"In general, wild grapes tend to have smaller fruits than domesticated grapes. In addition, most wild vines produce only male or female flowers, which are very fragrant. Domesticated cultivars have been selected for self-fertile flowers and larger, sweeter fruits."
	Missouri Botanical Garden. (2021). Vitis vinifera. http://www.missouribotanicalgarden.org. [Accessed 2 Aug 2021]	"This grape is self-pollinating."
	Dangl, G. S., Mendum, M. L., Yang, J., Walker, M. A., & Preece, J. E. (2015). Hybridization of cultivated Vitis vinifera with wild V. californica and V. girdiana in California. Ecology and Evolution, 5(23), 5671-5684	"Under cultivation, V. vinifera seed production is primarily through selfing and results in very high inbreeding depression; such seeds produce very few normal, vital seedlings."

605	Requires specialist pollinators	n
	Source(s)	**Notes**

Qsn #	Question	Answer
	Abrol, D.P. (2015). Pollination Biology, Vol.1: Pests and Pollinators of Fruit Crops. Springer International Publishing, Switzerland	"Majority of the varieties under the species vinifera are self-pollinated, however, some self-sterile varieties require insects like beetles, halicitids, syrphids and honeybees for pollination (Armstrong 1945 ; Safran 1954 ; Crane and Walker 1984 ; Brantjes 1978). But there has been a diverse opinion on the role of pollinating agents. For example, Einset (1930) stated that insects can not be depended upon for their role in pollination, Similarly, Gladwin (1937) reported that bees have a minor importance in grapes pollination and wind may be the major agent affecting pollination.. Knuth (1908) and Munson (1899) gave credit both to insects as well as wind, although the stigma is not adapted for wind pollination as the amount of pollen produced is very small. Most of the investigators have given credit to honeybees as the most important pollinators of grapes (Husmann and Dearing 1913 , 1916). Reimer and Detjen (1910) and Olmo (1943) reported honey bees and flies as the most important pollinators. Steshenko (1958) and Barskii (1956) reported that honey bees increased the weight of grape clusters by 23–54 %. Some other investigators (Dearing 1938) considered the Halictus bee as an excellent pollinator of grape flowers. Grapes have been reported to benefit from bee pollination. Laiok (1953) compared the production in six cultivars in cages and with bee visitation. He found that production was higher up to 5–15 % in cages with bees. He further found that production decreased as the distance from apiary increased."
	Hickey, M. & King, C. (1988). 100 Families of Flowering Plants. Cambridge University Press, Cambridge, UK	"Pollination. Bees and other insects have been seen visiting the flowers of V. vinifera which, although attractively scented, apparently produce little pollen and, at least in the more northerly areas of cultivation, no nectar. However, in warmer regions, the glands situated between the bases of the filaments have been observed to secrete abundant nectar. It is possible that some wind-pollination may take place and even more likely that self-pollination may occur as the stamens and stigma reach maturity at the same time."

606	Reproduction by vegetative fragmentation	y
	Source(s)	**Notes**
	Webb, C. J., Sykes, W. R., & Garnock-Jones, P. J. (1988). Flora of New Zealand Volume IV. Botany Division, DSIR, Christchurch, New Zealand	"Wild grapes form dense tangled thickets and climb to c. 15 m high on trees; they mainly or solely spread by copious stem layers."

Qsn #	Question	Answer
607	**Minimum generative time (years)**	**>3**
	Source(s)	**Notes**
	Gao, G. (ed.). (2009). Midwest Home Fruit Production Guide. Bulletin 940. The Ohio State University, Columbus, OH	"Vines should be well□established in the first three years to assure full production by the fourth year. This will require careful management of the macro□nutrients (primary and secondary) and micro□nutrients."
	South Dakota State University. (2015). Improving Cold-Hardy Grape Varieties. https://www.newswise.com/articles/improving-cold-hardy-grape-varieties. [Accessed 2 Aug 2021]	"Vines take three years to fruit and up to 10 years to reach mature production, so the cultivars that producers choose have long-term impact on their businesses."

701	**Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)**	**n**
	Source(s)	**Notes**
	Lim, T.K. (2013). Edible Medicinal And Non-Medicinal Plants. Volume 6, Fruits. Springer, Dordrecht	"Fruit a berry, ellipsoid to globose, 6–25 mm diameter, with soft skin adhering to the pulp, dark blue-purple, black, red, green or yellow, juicy, sweet or sour , seeded or seedless (Plates 1 – 10). Seeds 2–3, obovoid to pyriform, apex subrounded." [No means of external attachment]

702	**Propagules dispersed intentionally by people**	**y**
	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	"In Hawai'i, wine grapes are grown commercially on Maui; in the past, small vineyards existed, mostly near Hilo."
	Flora of North America Editorial Committee. (2016). Flora of North America North of Mexico. Volume 12. Magnoliophyta: Vitaceae to Garryaceae. Oxford University Press, New York and Oxford	"introduced widely."
	Lim, T.K. (2013). Edible Medicinal And Non-Medicinal Plants. Volume 6, Fruits. Springer, Dordrecht	"It is cultivated on every continent except for Antarctica."

703	**Propagules likely to disperse as a produce contaminant**	**n**
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Dispersed by: Humans, Animals, Flyers, Livestock, Sheep, Vehicles, Escapee"
	Lim, T.K. (2013). Edible Medicinal And Non-Medicinal Plants. Volume 6, Fruits. Springer, Dordrecht	"Fruit a berry, ellipsoid to globose, 6–25 mm diameter, with soft skin adhering to the pulp, dark blue-purple, black, red, green or yellow, juicy, sweet or sour , seeded or seedless (Plates 1 – 10). Seeds 2–3, obovoid to pyriform, apex subrounded." [Unlikely. Cultivated intentionally, with relatively large fruit and seeds]

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

Qsn #	Question	Answer
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Dispersed by: Humans, Animals, Flyers, Livestock, Sheep, Vehicles, Escapee"
	Lim, T.K. (2013). Edible Medicinal And Non-Medicinal Plants. Volume 6, Fruits. Springer, Dordrecht	"Fruit a berry, ellipsoid to globose, 6–25 mm diameter, with soft skin adhering to the pulp, dark blue-purple, black, red, green or yellow, juicy, sweet or sour , seeded or seedless (Plates 1 – 10). Seeds 2–3, obovoid to pyriform, apex subrounded."

705	Propagules water dispersed	n
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Dispersed by: Humans, Animals, Flyers, Livestock, Sheep, Vehicles, Escapee"

706	Propagules bird dispersed	y
	Source(s)	**Notes**
	Lim, T.K. (2013). Edible Medicinal And Non-Medicinal Plants. Volume 6, Fruits. Springer, Dordrecht	"Fruit ovoid berry, 12–20 mm long 8–11 mm, with a suture on one side, borne on 12–20 mm long peduncle, pale green turning to purplish or white speckled with purple or red (Plates 2 – 4) and containing about 20–40 tiny, 2–3 mm long by 2 mm wide, black, comma-shaped seeds (Plate 4)."
	Wyman, T., & Kelly, D. (2017). Quantifying seed dispersal by birds and possums in a lowland New Zealand forest. New Zealand Journal of Ecology, 41(1), 47-55	"Of the seeds that could be identified as native or exotic (99% of all seeds), 98% were native, with Berberis glaucocarpa and Vitis vinifera being the only exotic species found. Bellbirds dispersed only native seeds, while the introduced animals plus silvereyes had small percentages of their dispersed seeds being exotic (blackbird 1.7%, silvereyes and possum 1.8%, song thrush 7.8%)."
	Hosking, J. R., Conn, B. J., & Lepschi, B. J. (2003). Plant species first recognised as naturalised for New South Wales over the period 2000–2001. Cunninghamia, 8(2): 175-187	"Spread by bird-dispersed seed. Vitis vinifera has naturalised in Western Australia (PERTH specimen) and Victoria (MEL specimen)."

707	Propagules dispersed by other animals (externally)	n
	Source(s)	**Notes**
	Lim, T.K. (2013). Edible Medicinal And Non-Medicinal Plants. Volume 6, Fruits. Springer, Dordrecht	"Fruit a berry, ellipsoid to globose, 6–25 mm diameter, with soft skin adhering to the pulp, dark blue-purple, black, red, green or yellow, juicy, sweet or sour , seeded or seedless (Plates 1 – 10). Seeds 2–3, obovoid to pyriform, apex subrounded." [No means of external attachment]
	West, C.J. (2011). Consideration of rat impacts on weeds prior to rat and cat eradication on Raoul Island, Kermadecs. Pp. 244-247 In: Veitch, C. R.; Clout, M. N. and Towns, D. R. (eds.). Island invasives: eradication and management. IUCN, Gland, Switzerland	[Rats act as seed and possibly flower predators] "The five species that were not known to fruit in the presence of rats were Vitis vinifera L. (grape), Hibiscus tiliaceus L. (shore hibiscus, fou), Catharanthus roseus (L.) G. Don (rosy periwinkle), Bryophyllum pinnatum (Lam.) Oken (airplant), and Phoenix dactylifera L. (date)."

708	Propagules survive passage through the gut	y
	Source(s)	**Notes**

Qsn #	Question	Answer
	Matías, L., Zamora, R., Mendoza, I., & Hódar, J. A. (2010). Seed dispersal patterns by large frugivorous mammals in a degraded mosaic landscape. Restoration Ecology, 18(5), 619-627	"The appearance of species originating from outside the study area was in a very low percentage of the scats (5%). These plant species (mainly fig, Ficus carica; sour cherry, Prunus avium; and grape, Vitis vinifera) are cultivated some kilometers away from the study area shows that mammals can act as long-distance dispersal vectors."

801	Prolific seed production (>1000/m2)	n
	Source(s)	**Notes**
	Love, K. and Paull, R. E. (2014). Growing Grapes in Hawai'i. F_N-26. CTAHR, University of Hawai'i at Mānoa, Honolulu, HI	"Most grapes are propagated vegetatively from either green but mature wood or from dormant hardwood. Dormant hardwood cuttings at least one centimeter in diameter (~0.5 inch) are preferred."
	Dangl, G. S., Mendum, M. L., Yang, J., Walker, M. A., & Preece, J. E. (2015). Hybridization of cultivated Vitis vinifera with wild V. californica and V. girdiana in California. Ecology and Evolution, 5(23), 5671-5684	"Under cultivation, V. vinifera seed production is primarily through selfing and results in very high inbreeding depression; such seeds produce very few normal, vital seedlings."

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	**Notes**
	Love, K. and Paull, R. E. (2014). Growing Grapes in Hawai'i. F_N-26. CTAHR, University of Hawai'i at Mānoa, Honolulu, HI	"Most grapes are propagated vegetatively from either green but mature wood or from dormant hardwood." [Possibly no in Hawaii]
	Royal Botanic Gardens Kew. (2021) Seed Information Database (SID). Version 7.1. http://data.kew.org/sid/ . [Accessed 2 Aug 2021]	"Storage Behaviour: Orthodox Storage Conditions: No problem for long-term storage under IPGRI preferred conditions (SSLR)"
	Steenwerth, K., Baumgartner, K., Belina, K., & Veilleux, L. (2010). Vineyard Weed Seedbank Composition Responds to Glyphosate and Cultivation after Three Years. Weed Science, 58(3), 310-316	"Table 2. Weed species identified in seedbank 3 yr after treatment establishment" [Includes Vitis vinifera present in seed bank in a vineyard system, although it has not been determined that the seeds are 3 years old]
	Dangl, G. S., Mendum, M. L., Yang, J., Walker, M. A., & Preece, J. E. (2015). Hybridization of cultivated Vitis vinifera with wild V. californica and V. girdiana in California. Ecology and Evolution, 5(23), 5671-5684	"Under cultivation, V. vinifera seed production is primarily through selfing and results in very high inbreeding depression; such seeds produce very few normal, vital seedlings." [Possibly no in cultivation]

803	Well controlled by herbicides	y
	Source(s)	**Notes**
	West, C.J. (2011). Consideration of rat impacts on weeds prior to rat and cat eradication on Raoul Island, Kermadecs. Pp. 244-247 In: Veitch, C. R.; Clout, M. N. and Towns, D. R. (eds.). Island invasives: eradication and management. IUCN, Gland, Switzerland	"Grapes were formally targeted for eradication in 1998 as a result of this analysis. Initially Grazon (triclopyr-based herbicide) and Roundup (glyphosate) were used to kill grape vines. Later Vigilant (a gel formulation of picloram) was used. Grapes took considerable effort to kill but by 2008–09 just two grape sprouts were found (Fig. 3) and none were ever observed flowering or fruiting (they were killed before getting to this stage)."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	

Qsn #	Question	Answer
	Source(s)	**Notes**
	Webb, C. J., Sykes, W. R., & Garnock-Jones, P. J. (1988). Flora of New Zealand Volume IV. Botany Division, DSIR, Christchurch, New Zealand	"In cultivation such rampant growth is usually checked by annual pruning."
	Love, K. and Paull, R. E. (2014). Growing Grapes in Hawai'i. F_N-26. CTAHR, University of Hawai'i at Mānoa, Honolulu, HI	"Vines are pruned, first to control the size and style of the vine, then to balance flowering, fruit, and vegetative growth. Training is necessary to maximize sunlight entry into the canopy and productivity. Vines are also trained and pruned to facilitate harvesting. Many varieties respond better to specific pruning and training styles, indicating that research is needed to determine what system works for each variety."
	Gao, G. (ed.). (2009). Midwest Home Fruit Production Guide. Bulletin 940. The Ohio State University, Columbus, OH	[Tolerates pruning at certain times of year] "Pruning should be done each year in either late February or during March. At this time, the canes are still dormant, and there is little or no chance of buds being damaged."

805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	
	Source(s)	**Notes**
	Love, K. and Paull, R. E. (2014). Growing Grapes in Hawai'i. F_N-26. CTAHR, University of Hawai'i at Mānoa, Honolulu, HI	"There are numerous other diseases, insects, mites, and nematodes that can affect grape vines. In all cases, good horticultural practices can prevent problems." [Pests and pathogens, along with climatic conditions, may limit the ability of grapes to spread in the Hawaiian Islands]

Summary of Risk Traits:

High Risk / Undesirable Traits
• Naturalized in several locations worldwide; adventive, and possibly naturalized, on Kauai and Hawaii islands
• Often described as weedy and potentially invasive in a number of locations, but these plants may actually be hybrids with wild grapes rather than cultivars used for fruit and wind production
• Other Vitis species are invasive
• Affected by a number of pests and pathogens that could impact or commercially or environmentally important plants
• Tolerates many soil types
• Climbing and smothering growth habit
• Reproduces by seeds and vegetatively by layering
• Hybridizes with other Vitis species
• Self-fertile
• Seeds dispersed by birds, other frugivorous animals, and intentionally by people

Low Risk Traits
• Cultivated grapes may be less weedy or aggressive than wild grapes or hybrids
• Unarmed (no spines, thorns, or burrs)
• Palatable to browsing animals
• Non-toxic
• Seed set in cultivated grapes may be low, limiting ability for accidental or longer distance dispersal
• Herbicides may provide effective control if removal is required