Characteristics of important rootstocks for California vineyards

			Nematode Resistance		Tolerance				Influence on scion				
Rootstock	*Vitis* parentage	Phylloxera resistance	Root knot	Dagger *(Xiphinema index)*	Drought	Wet soil	Salinity	Lime	Vigor	mineral nutrition[7]	Soil adaptation	Ease of propagation	Other characteristics
Riparia Gloire	*riparia*	H[1]	M-H	M	L	M	L	L	L	N, P = L; K, Mg = L-M	Deep, well-drained, fertile, moist soils	H	Early maturation; scions tend to overbear
St. George (Rupestris du lot)	*rupestris*	H[2]	L	L	L-M shallow soils; H-deep soils	L-M	M-H	L	H	N = H; K = H ; P = L on low P soils; H on high P soils	Deep and gravelly soils	H	Fruit set problems with some scions; latent virus tolerant
SO4	*berlandieri* x *riparia*	H	M	M	L-M	M	L-M	M-H	L-M	N = L-M; P = M K = M-H; Mg = M	Moist, clay soils	M	Noted as a cool region rootstock
5BB	*berlandieri* x *riparia*	H	M-H	M	M	L	M	M-H	M	N = M-H; P, K, Zn = M Ca, Mg = M-H	Moist, clay soils	H	Susceptible to phytophthora root rot; adapted to high vigor varieties
5C	*berlandieri* x *riparia*	H	M	M	L	L-M	M	M-H	L-M	N = L; P, K = M Mg = M-H; Zn = L-M	Moist, clay soils	H	–
420A Mgt	*berlandieri* x *riparia*	H	L-M	L	L	M	L	M-H	L-M	N, P, K = L; Mg = M; Zn = LM	Fine-textured, fertile soils	M	Scions tend to overbear when young
99R	*berlandieri* x *rupestris*	H	M	L-M	M-H	L	M	M	M-H	P = M; K = H; Mg = M	Tolerant of acid soil	M	Young scions may develop slowly
110R	*berlandieri* x *rupestris*	H	L	L	M-H[5]	L	M	M	M-H	N = M; P = H K = L-M; Mg, Zn = M	Hillside, gravelly and acid soils	L-M	Develops slowly in wet soils
140Ru	*berlandieri* x *rupestris*	H	L	L	H	L	H	H	H	N = M-H; P, Mg = H; K = L	Adapted to drought and acid soils	M	Does poorly in non-irrigated, low K soils
1103P	*berlandieri* x *rupestris*	H	M	L	M-H	M	M-H	M	H	N = M-H P, Mg = H; K, Zn = L-M	Adapted to drought and saline soils	H	–
3309 C	*riparia* x *rupestris*	H[2]	L	L	M	L-M	L-M	L	L-M	N = M-H P, Ca = L; K, Mg, Zn = M	Deep soils	H	Sensitive to latent viruses; tolerant of cold injury
101-14 Mgt	*riparia* x *rupestris*	M[2]	M-H	M	L	L	M	L	M	N, K = M-H P, Mg, Ca = L; Zn = M	Moist clay soils	H	Tolerates wet soils
Schwarzmann	*riparia* x *rupestris*	H	M	M-H	M	M	M-H	M	M	N, P = M; K = M-H; Mg = L	Moist, deep soils	H	–
44-53 M	*riparia* x (*cordifolia* x *rupestris*)	H	L	–	M	M	L	L	M	N = L-M; P, Mg, Ca = L; K = H	High Mg soils	H	Readily Mg deficient in low Mg soils
1616 C	*acerifolia* x *riparia*	H	M-H	M-H	L	M	M	L	M	N = L; K = M-H	Best on fertile, med to fine textured soils; tolerates acid soils	H	Poor on infertile, sandy soils
Salt Creek (Ramsey)	*champinii*	H	H	M	H	L-M	M-H	M-H	H	N, P = H K = M-H; Zn, Mn = L	Sandy, infertile	L	Tolerant to Phytophthora
Dog Ridge	*champinii*	M-H	H	M	H	L-M	M-H	M	VH	N, P = H; K = M; Zn = L	V. sandy, infertile	L	Promotes excess vigor, poor fruit set
Harmony	1613 (*solonis* x Othello) x Dog Ridge	L[3]	L-M[4]	M-H	M-H	L	L-M	M	H	N = L; P = M; K = H; Zn = L-M	Sandy loams and loamy sands	H	–
Freedom	1613 (*solonis* x Othello) x Dog Ridge	L[3]	H[4]	H	H	L	M	M	H	N, P, K = H; Mg = M; Zn, Mn = L	Sands to sandy loams	M-H	Sensitive to latent viruses
039-16	*vinifera* x *rotundifolia*	H	L	H	L	M	L	L	H	N, K = H; P = L-M; Zn = L	Poor on coarse, sandy soils due to low root knot nematode tolerance	VL	Tolerant of fanleaf virus
RS -3	Ramsey x Schwarzman	–	H	H	–	–	–	–	M-H	–	–	–	–
RS - 9	Ramsey x Schwarzman	–	H	H	–	–	–	–	L	–	–	–	–
UCD GRN-1 (8909-05)	*V. rupestris* x *M. rotundifolia*	VH	VH[4]	VH	M	–	M-H[6]	–	M-H	–	–	–	–
UCS GRN-2 (9363-16)	(*V. rufotomentosa* x (Dog Ridge x Riparia Gloire)) x Riparia Gloire	VH	VH[4]	VH	M	–	M	–	M	–	–	–	–
UCD GRN-3 (9365-43)	(*V. rufotomentosa* x (Dog Ridge x Riparia Gloire)) x *V. champinii* c9038	H	VH[4]	VH	M-H	–	M	–	M-H	–	–	–	–
UCD GRN-4 (9365-85)	(*V. rufotomentosa* x (Dog Ridge x Riparia Gloire)) x *V. champinii* c9038	H	VH[4]	VH	H	–	M	–	M-H	–	–	–	–
UCD GRN-5 (9407-14)	(Ramsey x Riparia Gloire) x *V. champinii* c9021	M-H	VH[4]	VH	H	–	M	–	H	–	–	–	–

[1]Ratings: VL = very low; L = low; M = medium; H = high; VH = very high.
[2]Will support populations of phylloxera but will not form tuberosities.
[3]The degree of long-term phylloxera resistance is questionable due to the unknown *Vitis vinifera* parentage of these rootstocks.
[4]Resistence is based on most species of root knot nematodes, but not all.
[5]Once established
[6]Recent experimentation has shown fairly strong salt tolerance
[7]Influence on scion mineral nutrition refers to comparative petiole tissue levels of nutritional elements

Characteristics of important rootstocks for California vineyards, courtesy of University of California, Davis, updated Dec. 2014 by Dr. Andy Walker