Characteristics of important rootstocks for California vineyards

			Nematode Resistance		Tolerance			
Rootstock	*Vitis* parentage	Phylloxera resistance	Root knot	Dagger *(Xiphinema index)*	Drought	Wet soil	Salinity	Lime
Riparia Gloire	*riparia*	H[1]	M-H	M	L	H	L	L
St. George (Rupestris du lot)	*rupestris*	H[2]	L	L	L-M shallow soils; H-deep soils	L-M	M-H	L
SO4	*berlandieri* x *riparia*	H	M	M	M	M	M	M-H
5BB	*berlandieri* x *riparia*	H	M-H	M	M	L	M	M-H
5C	*berlandieri* x *riparia*	H	M	M	L	L-M	M	M-H
420A Mgt	*berlandieri* x *riparia*	H	L-M	L	L	M	L	M-H
99R	*berlandieri* x *rupestris*	H	M	L-M	M-H	L	M	M
110R	*berlandieri* x *rupestris*	H	L	L	M-H[5]	L	M	M
140Ru	*berlandieri* x *rupestris*	H	L	L	H	L	M	H
1103P	*berlandieri* x *rupestris*	H	M	L	M-H	M	M-H	M
3309 C	*riparia* x *rupestris*	H[2]	L	L	M	L-M	L-M	L
101-14 Mgt	*riparia* x *rupestris*	M[2]	M-H	M	L	M	L	L
Schwarzmann	*riparia* x *rupestris*	H	M	M-H	M	M	M-H	M
44-53 M	*riparia* x (*cordifolia* x *rupestris*)	H	L	–	M	M	L	L
1616 C	*acerifolia* x *riparia*	H	M-H	M-H	L	M-H	M	L
Salt Creek (Ramsey)	*champinii*	H	H	M	H	L-M	H	M-H
Dog Ridge	*champinii*	M-H	H	M	H	L-M	M-H	M
Harmony	1613 (*solonis* x Othello) x Dog Ridge	L[3]	L-M[4]	M-H	M-H	L	L-M	M
Freedom	1613 (*solonis* x Othello) x Dog Ridge	L[3]	H[4]	H	H	L	M	M
039-16	*vinifera* x *rotundifolia*	H	L	H	L	M	L	L
RS-3	Ramsey x Schwarzman	–	H	H	L-M	–	–	–
RS-9	Ramsey x Schwarzman	–	H	H	L-M	–	–	–
UCD GRN-1 (8909-05)	*V. rupestris* x *M. rotundifolia*	VH	VH[4]	VH	M	–	M-H[6]	–
UCS GRN-2 (9363-16)	(*V. rufotomentosa* x (Dog Ridge x Riparia Gloire)) x Riparia Gloire	VH	VH[4]	VH	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	–
UCD GRN-4 (9365-85)	(*V. rufotomentosa* x (Dog Ridge x Riparia Gloire)) x *V. champinii* c9038	H	VH[4]	VH	M-H	–	M	–
UCD GRN-5 (9407-14)	(Ramsey x Riparia Gloire) x *V. champinii* c9021	M-H	VH[4]	VH	H	–	M	–

[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.

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Influence on scion				
Vigor	mineral nutrition[7]	Soil adaptation	Ease of propagation	Other characteristics
L	N, P = L; K, Mg = L-M	Deep, well-drained, fertile, moist soils	H	Early maturation; scions tend to overbear
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
L-M	N = L-M; P = M K = M-H; Mg = M	Moist, clay soils	M	Noted as a cool region rootstock
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
L-M	N = L; P, K = M Mg = M-H; Zn = L-M	Moist, clay soils	H	Prone to Tyloses
L-M	N, P, K = L; Mg = M; Zn = LM	Fine-textured, fertile soils	L	Scions tend to overbear when young
M-H	P = M; K = H; Mg = M	Hillside, gravelly and sandy soils	M	Young scions may develop slowly
M-H	N = M; P = H K = L-M; Mg, Zn = M	Hillside, gravelly and sandy soils	L-M	Develops slowly in wet soils
H	N = M-H; P, Mg = H; K = L	Adapted to drought	M	Does poorly in non-irrigated, low K soils
H	N = M-H P, Mg = H; K, Zn = L-M	Adapted to drought and saline soils	H	–
L-M	N = M-H P, Ca = L; K, Mg, Zn = M	Deep soils	H	Sensitive to latent viruses; tolerant of cold injury
M	N, K = M-H P, Mg, Ca = L; Zn = M	Moist clay soils	H	Ripens early
M	N, P = M; K = M-H; Mg = L	Moist, deep soils	H	–
M	N = L-M; P, Mg, Ca = L; K = H	High Mg soils	H	Readily Mg deficient in low Mg soils
M	N = L; K = M-H	Best on fertile, med to fine textured soils; tolerates acid soils	L	Poor vigor on infertile, sandy soils
H	N, P = H K = M-H; Zn, Mn = L	Sandy, infertile	L	Tolerant to Phytophthora
VH	N, P = H; K = M; Zn = L	V. sandy, infertile	L	Promotes excess vigor, poor fruit set
H	N = L; P = M; K = H; Zn = L-M	Sandy loams and loamy sands	H	–
H	N, P, K = H; Mg = M; Zn, Mn = L	Sands to sandy loams	M-H	Sensitive to latent viruses
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
M-H	–	–	M	–
L	–	–	M	–
M	–	–	–	Has likely tolerance to fanleaf
M	–	–	–	–
M-H	–	–	–	–
M-H	–	–	–	–
M	–	–	–	–

[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