

### Characteristics of important rootstocks for California vineyards

	Vitis parentage	Phylloxera resistance	Nematode Resistance		Tolerance					Influence on scion			Soil adaptation	Ease of propagation	Other characteristics	
			Root Knot	Dagger <sup>1</sup> (Xiphinema index)	Drought	Wet soil	Salinity	Lime	Vigor	mineral nutrition <sup>2</sup>						
Rootstock																
Riparia Gloire	<i>riparia</i>	H <sup>1</sup>	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)	<i>rupestris</i>	H <sup>2</sup>	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	<i>berlandieri x riparia</i>	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		
588	<i>berlandieri x riparia</i>	H	M-H	M	M	M	M-H	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	<i>berlandieri x riparia</i>	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	<i>berlandieri x riparia</i>	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	<i>berlandieri x rupestris</i>	H	M	M	M-H	M	M	M	M-H	P = M; K = H; Mg = M		Tolerant of acid soil	M	Young scions may develop slowly		
110R	<i>berlandieri x rupestris</i>	H	L	L	M-H <sup>5</sup>	L	M	M	M-H	N = M; P = H K = L-M; Mg, Zn = M		Hillsides, gravelly and acid soils	L-M	Develops slowly in wet soils		
140Ru	<i>berlandieri x rupestris</i>	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	<i>berlandieri x rupestris</i>	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	<i>riparia x rupestris</i>	H <sup>2</sup>	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	<i>riparia x rupestris</i>	M <sup>2</sup>	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	<i>riparia x rupestris</i>	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	<i>riparia x (cordifolia x rupestris)</i>	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	<i>acerifolia x riparia</i>	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)	<i>champini</i>	H	H	M	L-M	M-H	M-H	M-H	H	N, P = H K = M-H; Zn, Mn = L		Sandy, infertile	L	Tolerant to Phytophthora		
Dog Ridge	<i>champini</i>	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 (solons x Ohelio) x Dog Ridge	L <sup>3</sup>	L-M <sup>4</sup>	M-H	H	L	L-M	M	H	N = L; P = M; K = H; Zn = L-M		Sandy loams and loamy sands	H	-		
Freedom	1613 (solons x Ohelio) x Dog Ridge	L <sup>3</sup>	H <sup>4</sup>	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	<i>vinifera x rotundifolia</i>	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)	<i>V. rupestris x M. rotundifolia</i>	VH	VH <sup>4</sup>	VH	M	M-H <sup>6</sup>	-	-	M-H	-		-	-	-	-	
UCS GRN-2	<i>(V. rotundifolia x Dog Ridge x (9363-16) x Riparia Gloire) x Riparia Gloire</i>	VH	VH <sup>4</sup>	VH	M	M	-	-	M	-		-	-	-	-	
UCD GRN-3 (9365-43)	<i>(V. rotundifolia x Dog Ridge x (9365-43) x Riparia Gloire) x V. champini c9038</i>	H	VH <sup>4</sup>	VH	M-H	M	-	-	M-H	-		-	-	-	-	
UCD GRN-4 (9365-85)	<i>(V. rotundifolia x Dog Ridge x (9365-85) x Riparia Gloire) x V. champini c9038</i>	H	VH <sup>4</sup>	VH	H	M	-	-	M-H	-		-	-	-	-	
UCD GRN-5 (9407-14)	Ramsey x Riparia Gloire x V. champini c9021	M-H	VH <sup>4</sup>	VH	H	M	-	-	H	-		-	-	-	-	

Ratings: VL = very low; L = low; M = medium; H = high; VH = very high.  
<sup>1</sup>Will support populations of phylloxera but will not form tuberosities.  
<sup>2</sup>The degree of long-term phylloxera resistance is questionable due to the unknown *Vitis vinifera* parentage of these rootstocks.  
<sup>3</sup>Resistance is based on most species of root knot nematodes, but not all.  
<sup>4</sup>Once established  
<sup>5</sup>Recent experimentation has shown fairly strong salt tolerance  
<sup>6</sup>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