

Rootstock	Synonym	Parentage	Vigor	Pyloxera Resistance	Nematode X. Index (Dagger)	Resistance M. incognita (Root-Knot)	Soil Preference	Drought Tolerance	Wet Feet	Active Lime Tolerance	Salt Tolerance	Influence on Maturity	General Comments
Riparia Gloire	Gloire de Montpellier	V. riparia	Low/Moderate	High		Moderate	Deep/Fertile	Low	High	Low <6%		Early	
Saint George	Rupestris du Lot	V. rupestris	Very High	High		Susceptible but Tolerant	Deep, Uniform Loam	High	Low	14%	Moderate	Late	Susceptible to oak root fungus. Suitable for deep, dry farmed sites. Tends to reduce fruit set on vigorous site.
1616 Couderc	1616C	V. solonis x V. riparia	Low	Moderate/High		Moderate	Deep/Fertile		High	11%	Moderate/High	Early	
3309 Couderc	3309C	V. riparia x V. rupestris	Moderate/High	High	Susceptible	Susceptible	Deep Well-Drained	Low	High	11%	Low/Moderate	Mid	
44-53 Malegue	44-53M	V. riparia x 144M	Moderate	Moderate/High	Moderate	Susceptible	Loam/Good Fertility	Moderate	High	10%		Mid	Often suffers from Mg deficiency
101-14 Millardet Et De Grasset	101-14 Mgt.	V. riparia x V. rupestris	Low/Moderate	High		Moderate	Heavy Clay	Low/Moderate	High	9%	Very Low	Early	More vigorous than Riparia Gloire
Swarzmann	Swarzmann	V. riparia x V. rupestris	Low/Moderate	High	High	Some	Deep/Fertile	Low/Moderate		6-9%			
41B Millardet Et De Grasset	41B	V. berlandieri x V. vinifera		Low	Susceptible	Susceptible	Dry Lime	Low/Moderate	Low	40%	Very Low	Early	
420A Millardet Et De Grasset	420A	V. berlandieri x V. riparia	Low	Moderate		Moderate	Deep/Fertile	Low	Moderate	20%	Low	Late	Suitable for high density plantings. Less vigorous than 5C and 5BB. Susceptible to potassium deficiency. Suitable for high density plantings.
Oppenheim #4	SO4	V. berlandieri x V. riparia	Moderate	High	High	Moderate	Clay	Low	High	18%	Low	Mid	
5BB Kober	5BB	V. berlandieri x V. riparia	Moderate	High		Moderate	Clay	Low	High	20%	Very Low	Mid	Slightly more drought tolerant than 5C or 420A, yet less than 110R and St. George. Not recommended for sites with standing water or a history of phytophthora. Genetically identical to 5A.
5C Teleki	5C	V. berlandieri x V. riparia	Moderate	High	High	Moderate High	Clay	Low	High	20%		Early	Similar to 5BB, more suitable for higher attitudes. Broad spectrum of nematode tolerance.
1103 Paulsen	1103P	V. berlandieri x V. rupestris	High	High	Susceptible	Moderate	Clay, Lime	High	High	18%	Moderate	Late	Vigor is between 99R and 110R
RS-3	RS-3	Ramsey x Schwarzman	Low		High	High	Sandy		Low-Medium		Medium	Medium-High	RS-3 should not be over-irrigated. Fanleaf tolerant and broad nematode resistance.
RS-9	RS-9	Ramsey x Schwarzman	Medium		High	High			Low-Medium		Medium	Low	Suited for close plantings, broad nematode resistance
Kingfisher	PC01126-29	V. champinii x V. rufotomentosa x Riparia Gloire	High		Resistant	High							
Matador	PC0188-151	101-14 Mgt x (V. mustangensis x V. rupestris)	High		Resistant	High							
Minotaur	PC0188-32	101-14 Mgt x (V. mustangensis x V. rupestris)	High		Resistant	High							
GRN-1	8909-05	V. Rupestris x Muscadinia	Moderate/High	Very High	Very High	Very High		Moderate	Tolerant	Low	Low	Moderate/High	Highly resistant to ring, citrus and lesion nematodes
GRN-2	9363-16	V. rufotomentosa x V. Champinii	Low/Moderate	Very High	Very High	Very High		Moderate	Moderate	Moderate	Moderate?	Low/Moderate	Highly resistant to lesion nematode and moderately resistant to citrus and ring nematode
GRN-3	9365-43	V. rufotomentosa x V. Champinii+	Moderate+	Very High	Very High	Very High		Moderate/High	Moderate	Moderate/High	Moderate/High?	Moderate+	Also resists citrus and lesion nematodes, but not ring
GRN-4	9365-85	V. rufotomentosa x V. Champinii+	Moderate/High	Very High	Very High	Very High		High	Moderate	Moderate/High	Moderate/High?	Moderate/High	Also resists citrus and lesion nematodes, low to moderate ring resistance

GRN-5	9407-14	V. Champinii x V. Berlandieri x V. Riparia	High	Very High	Very High	Very High		High	Low/ Moderate	Moderate/ High	Moderate/ High?	High	Also resists citrus and lesion nematodes, moderate ring resistance, moderately difficult to propagate
110 Richter	110R	V. berlandieri x V. rupestris	High	High		Moderate	Moderate Fertility	High	High	17%	Moderate	Late	Suitable for hill-side-sand, dry-farmed sites can be overly vigorous on deep fertile soils.
140 Ruggeri	140Ru, Ru 140	V. berlandieri x V. rupestris	Very High	High		Moderate	Sandy Moderate Fertility	High	Moderate	20%	Moderate	Late	Tolerates a wide variety of soil.
Freedom	Freedom	1613 C x V.champinii	High	Moderate	Very High	High	Sandy Moderate Fertility	Moderate/ High	Low		Low	Late	Must use virus free scion material. More vigorous than Harmony, but less than Dog Ridge and Salt Creek.
Harmony	Harmony	1613 C x V. champinii	High	Low	Susce	High	Sandy Moderate Fertility	Moderate/ High					More vigorous than 1613C, less than Dog Ridge and Salt Creek.
Ramsey	Salt Creek	V. champinii	Very High	Moderate	High	High	Light Sand Low Fertility	High	Moderate		High	Late	Tends to have Zn deficiency. Less vigorous than Dog Ridge. Reduced fruit set.
VR 039-16	039-16	V. vinifera x V. rotundifolia	High	Low	Very High	Susceptible		Low				Late	Highly recommended for vineyard sites infested with grape fan leaf virus.

**BIBLIOGRAPHY:**

GALET, P. 1979. APRACTICAL AMPELOGRAPHY GRAPEVINE IDENTIFICATION. CORNELL UNIVERISTY PRESS, ITHACA, 248.P; PONGRACZ, D.P. 1983. ROOTSTOCKS FOR GRAPEVINES. DAVID PHILIP PUB., CAPE TOWN, 150 P.  
WOLPERT, J., A. WALKER, E. WEBER, L. BETTIGA, R. SMITH, P. VERDEGAAL. "ROOTSTOCKS AND PHYLOXERA." VITICULTURAL NOTES, UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION NAPA COUNTY, NUMBER 6, APRIL 1, 1994.

*This data is meant to be used as an initial information source only. Other factors such as climate, soil conditions, nutrition and soil pests would influence overall vineyard status. We recommend that growers seek further advice from local consultants.*