

# Rootstocks in San Joaquin County – Overview

## LWC Breakfast Meeting *Nematode Control*

17 March 2015

1851 Grape growing – Mission > Flame Tokay (decent rootstock!)

1860 - 1900 Zinfandel, Carignane, Grenache, White's Prolific (Burger), Palomino and many others

1908 Phylloxera identified in Lodi

Initial production with vigorous and productive varieties

Shallow water tables, much "dry farming" or minimal irrigation; many first generation vineyards.

Flame Tokays in 1860s; vigorous, productive and served its own "rootstock"

Phylloxera

Introduction of St. George rootstock and transport of propagation material brought Dagger species and GFLV (and GLRAV, Corky bark, etc?)

Nematodes

Root knot spp. initial problems almost entirely; in recent years followed by Dagger (2 species), Ring, Lesion, Citrus and several others (some associated with damage, many not).

1920s -1930s Phylloxera still more of research focus; some nematode evaluations in UC trials.

Post WWII University trials and increased nematode problems fostered more use of Salt Creek (Ramsey), Dogridge, St George, and some "newer" stocks; AXR1, 1613C, 1616C, etc. Much field research in nematicides, both pre-plant and post-plant.

1974 Freedom and Harmony released

1980s O39-16 and O43-43 field trials and release

1975 to 1990 Freedom and Harmony become standards. Dogridge and Salt Creek continues on Zins. AXR1 failure creates concern of all rootstocks with *V. Vinifera* parentage (Freedom, Harmony, O39-16).

1990s to 2002 Planting boom encourages wide selection of older European rootstocks: 1103 Paulsen, Kober 5BB, SO4, 101-14Mgt, Teleki 5C, Schwarzmann, 3309C, 420A, 110R, etc. and still O39-16.

2005 –present increased field problems, regulatory intensification, and Mini-boom fosters new interest in some older rootstocks and newly available hybrids; RS3 & RS9, GRN 1 through 5, 1616C, etc.

2009 Field trial to compare GRN series with several standards against phylloxera, nematodes & GFLV

### Rootstock Rundown

**1103 Paulsen** Moderately High vigor (influence on scion); Nematode resistance good, (minus Dagger); Drought tolerance moderate high; good salinity; deep rooted- generally good for many varieties and many soils. Reported to decline in vigor with age. Similar to Freedom, without the high N & K levels and low Zn in scion.

**Kober 5BB** Medium vigor; Nematode resistance medium; Drought tolerance medium; good salinity; moderately rooted, good for many varieties, especially high vigor on good deep soils; Can have problems on heavy clays that crack.

**SO4** Medium to lower vigor; Nematode resistance good; shallow rooted, low medium drought tolerance, less tolerant of salinity; good for "moist" soils, but not wet; can have problems on heavy clays; better than 5C for heavy soils, but root damage possible from cracking in clays, also shuts down under water stress-hard to "restart".

**101-14 Mgt** Medium vigor; Nematode good to very good; fair drought tolerance, moderate rooted; good for high vigor vines, but sensitive to over cropping; medium N & K; good salinity tolerance; may be better suited to heavier soils to clays. Some concerns about Phylloxera resistance breaking, but no indication in Lodi.

**039-16** Very high vigor; Dagger nematode resistant, but fair to poor with other nematodes; Sensitive to drought stress, but will "grow" late into fall if soil moisture too good; deep rooted, can be a problem to manage vigorous late season varieties; High N and K, but can be K & Zn deficient, if water stressed; sensitive to salinity. Only choice for Fanleaf (GFLV) virus problem sites until recently.

**110R** High vigor; nematode resistance fair to poor; Drought tolerant, good salinity; deep rooted; appear to mine P very good; may be good in hillsides, similar to St. George (use as a missing vine filler); N levels medium and P very good, K good and Zn good. Needs very good drainage.

**3309 Couderc** Low to fair vigor, rooting slightly deeper than SO4 or 5C; Nematode resistance fair to poor in very sandy soils; Drought tolerance better than other low vigor stocks, fair to low salinity tolerance; N medium to high, K & Zn medium. Very sensitive to all viruses.

**Schwarzmann** Moderate vigor, can be high on fertile deep soils; Nematode resistance very good to high, even with Dagger; Moderate drought tolerance, salinity very good; tolerates wet soils to a degree.

**Teleki 5C** Low vigor (rootstock diameter much smaller than scion- almost as ID); Nematode resistance good, but less so Dagger; shallow rooted and stresses easily (also hard to regrow) but also less tolerant of excess soil water; N can be low in scion. Initially popular in Lodi, now not so much. Can match well with vigorous varieties on good soils that are well drained.

**420 A** Low vigor, but on very fertile soils with good soil moisture can be surprising; Nematode resistance good, but low against Dagger; Moderate drought tolerance; fair salinity, shallow rooted - may be better suited to river bottoms and the Delta; Nutrient levels may tend to be low. Young vines can overbear even more than other rootstocks.

**140 Ruggeri** Very high vigor; nematode resistance fair, poor against Dagger; Drought tolerance is high and salinity good; deep rooted, may be better for low vigor scions or in gravelly loams; K can be low

**RS 3** Medium vigor similar to 1103 Paulsen; very good versus nematodes, less so Dagger; medium salinity

**RS 9** Low vigor similar to 3309 C; similar to RS3, better against Dagger; some resistance to VMB?

**GRN 1 to 5** Vigor high to low 5 > 1 > 4 > 3 > 2; good nematode resistance Ring (1 best?); good salinity (1 best?); Phylloxera nodosity 5 highest.

**1616C** Low vigor "older rootstock" with renewed interest; Nematode resistance very good against Dagger GFLV (virus questionable); Drought tolerance low, but salinity very good; N can be low. May be a good candidate for Delta islands and for some sites with fine sandy loams to heavier loams.

**Freedom** Vigorous; N & K efficient; Zn deficient; extremely virus sensitive.

**Harmony** Same as Freedom, but seem to not decline under high nematode pressure as does Freedom.

**Ramsey** Very high vigor; drought tolerant; excellent nematode stock; good salinity low Zn & severe shatter from GFLV. Also known as Salt Creek

**Dog Ridge** Same as Ramsey, but historically has done well with head trained Zinfandel on coarse

**St George** High vigor; drought tolerant; tight cluster scions can be rot problem as Zinfandel; poor versus nematodes

This group all tend to be high vigor and can serve in limited sites and to meet specific production goals.

Others? 1613C; Riparia Gloire; USDA selections Matador & Minotaur (101-14), Kingfisher (Dog Ridge)

All rootstocks perform look very similar in good soils until several years of full production or under severe RDI program.

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