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Rootstock Evaluation for Premium Wine 2010-11

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1 Introduction

In 1991, a survey of Marlborough vineyards found *Phylloxera* to be widespread. Vineyards were replanted on a range of rootstocks, although the selection of rootstock often reflected its availability rather than its suitability for any particular site. In response to this, a rootstock trial was planted on the deep soils of the Rapaura area back in 1991. It is the Marlborough Research Centre's longest running trial and has provided information on the influence of rootstocks on Sauvignon blanc. It has also been a valuable resource for long-term data collection on yield parameters for the district. Vineyards are now being replaced and this trial is providing growers with information on the influence of yield and juice composition that can assist them in making a decision on the most suitable rootstock for their needs, either when planting a new block or replanting existing vines. It is well documented that grape vine rootstocks can influence yield and juice composition and therefore wine quality. This influence should not be underestimated when selecting the most suitable rootstock for growers' needs.

2 Results

Budbreak was earlier where vines were grafted to SO4 and 125AA rootstocks and had more than three leaves exposed on at least one quarter of the buds on the vine (Table 1). While this result has not always been statistically significant in previous seasons, the results have been consistently observed. Vines grafted to 3309 and Schwarzmann consistently resume growth later in the season, although again the results are not always statistically significant.

Table 1: Effect of rootstock on percentage of buds burst to greater than or equal to three leaves exposed on Sauvignon blanc on 15 October 2010.

Rootstock	Growth stage >/= 13 (Eichhorn & Lorenz)
101-14	24.30 bc
SO4	30.77 a
Schwarzmann	22.3 c
3309	23.96 bc
125 AA	27.51 ab
P	0.012
LSD (5%)	4.935

Means in the same column followed by the same letter are not significantly different (P > 0.05).

Table 2: Effect of rootstock on berry weights and juice composition of Sauvignon blanc at harvest on 6 April 2011.

Rootstock	Berry weight (g)	Soluble solids (^{o}Brix)	pH	Titratable Acidity (g/L)
101-14	2.12	19.72 ab	2.923	10.90 b
SO4	2.16	20.36 a	2.933	11.65 a
Schwarzmann	2.29	18.60 c	2.926	10.81 b
3309	2.18	19.30 bc	2.956	10.57 b
125 AA	2.24	20.44 a	2.936	11.12 ab
P	0.329	0.003	0.388	0.041
LSD (5%)	0.133	0.985	0.0368	0.697

Means in the same column followed by the same letter are not significantly different (P > 0.05).

This season, there were significant differences in soluble solids and titratable acidity from fruit of vines on different rootstocks. There were no differences in berry size. In 12 of the 14 seasons evaluated, Schwarzmann has produced the highest berry weight of any of the rootstocks. Schwarzmann also continues to produce fruit with the lowest soluble solids of any of the rootstocks at this site; this has been consistent over 14 seasons of data collection. For the past three seasons, SO4 has produced fruit with the highest titratable acidity of any of the rootstocks evaluated. For the past two seasons, 101-14 has produced fruit with the lowest pH and 3309 the highest (Table 2).

Table 3: Effect of rootstock on yield and yield components of Sauvignon blanc at harvest on 6 April 2011.

Rootstock	Average yield per vine (kg)	Average number of bunches per vine	Average bunch weight (g)
101-14	8.26	61.2	135.1
SO4	8.38	62.2	134.8
Schwarzmann	8.94	66.5	134.6
3309	9.45	68.1	139.1
125AA	9.21	62.4	145.5
P	0.442	0.39	0.339
LSD (5%)	1.525	8.52	12.44

Means in the same column followed by the same letter are not significantly different (P > 0.05).

There were no differences in yield, bunch number or bunch weight this season (Table 3). Vines grown on 3309 produced the highest yield and number of bunches per vine, while those on 101-14 produced the lowest yields and number of bunches per vine. Vines on 125AA produced the highest bunch weight and those on Schwarzmann the lowest.

Table 4: Effect of rootstocks on winter pruning weights and the yield to pruning weight ratio (Ravaz Index) of Sauvignon blanc, 2009-10 season.

Rootstock	Average weight of prunings per vine (kg)	Yield to pruning weight ratio (Ravaz Index)
101-14	1.28 c	5.74
SO4	1.79 a	4.47
Schwarzmann	1.39 bc	5.67
3309	1.54 b	5.06
125AA	1.54 b	5.40
P	0.001	0.085
LSD (5%)	0.230	0.996

Means in the same column followed by the same letter are not significantly different (P > 0.05).

There were significant differences between rootstocks for the winter pruning weights. In all seasons where winter pruning weights have been recorded, vines on SO4 produced the heaviest pruning weights and therefore the greatest vine vigour (Table 4). In the past two seasons, vines on 101-14 produced the least vine vigour, as measured by pruning weights.

3 Conclusions

Long-term evaluation is starting to reveal consistencies and trends between these rootstocks. Some of these are as follows:

- Vines on rootstocks SO4 and 125AA continue to produce the earliest shoot or bud development. This may make them more vulnerable to late spring frosts.
- Vines on Schwarzmann continue to produce the highest average berry weight and the lowest soluble solids content. This is not a reflection of differences in vine yield.
- Vines on SO4 continue to produce high acidity.
- Rootstocks 3309 and 125AA have produced the top yielding vines for the past four years, although these results are not always significant.
- Vines on SO4 continue to record the highest pruning weights and lowest Ravaz index (yield to pruning weight ratio), making SO4 the most vigorous of the rootstocks evaluated at this site.

These observations can assist growers in making informed decisions when selecting rootstocks best suited for their vineyards.

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