Plant & Food RESEARCH
RANGAHAU AHUMĀRA KAI

www.plantandfood.com

Rootstock Evaluation for Premium Wine 2009-10

Neal S, Trought M, West B

June 2010

A report prepared for:

Marlborough Research Centre

Neal S, Trought M, West B

Plant & Food Research, Blenheim

SPTS No. 4157

PFR Client Report No. 35307

This report has been prepared by The New Zealand Institute for Plant & Food Research Limited (Plant & Food Research), which has its Head Office at 120 Mt Albert Rd, Mt Albert, Auckland.

This report has been approved by:

Sue Neal
Scientist/Researcher, Winegrape Viticulture
Date: June 2010

Stuart Tustin
Science Group Leader, Crop and Food Production Systems
Date: June 2010

1 Introduction

There have been significant changes in the wine industry in the past few years, one of which is the continued expansion into areas not previously considered suitable for grape production. Many of the early vineyards on the Wairau Plains are in the process of being replanted as market demands change and the vines just age past their productive best. This gives the grower an opportunity to assess which varieties to plant and which rootstock to use.

It is well documented that grape rootstocks can influence yield and juice composition and therefore wine quality. This characteristic should not be underestimated when selecting the most suitable rootstock for growers' needs. Other factors to consider are tolerance to changes in soil moisture availability and the impact of early season frosts.

Plant & Food Research (and its predecessor HortResearch) has been evaluating a selection of rootstocks at a trial site on the Wairau Plains. This trial is the Marlborough Research Centre's longest running trial, having been planted in 1991 with data recorded from it for 13 years.

2 Method

Six rootstocks (101-14, Schwarzmann, 125AA, ARG1, SO4 and 3309) were grafted to Sauvignon blanc and planted as underplants in 1991 at a vine spacing of 3 x 1.8 m. The rootstock ARG1 was discontinued from the trial because its *Vitis vinifera* parentage makes it susceptible to *Phylloxera*. The trial was planted in two blocks, reflecting the change in soil type down the rows. One block is planted on a shallow stony sandy loam and the other on a moderately deep silt loam overlying gravels. The vines are vertically shoot positioned and an average of 52 buds per vine was laid down this year.

Data were collected encompassing a wide range of growth and harvest parameters.

3 Results

Table 1. Effect of rootstock on the proportion (%) of developing buds that had three or more exposed leaves by mid October 2009 on Sauvignon blanc vines.

Rootstock	**Growth stage >/= 13 (Eichhorn & Lorenz)**
101-14	24.31 ab
SO4	28.25 a
Schwarzmann	21.27 b
3309	21.89 b
125 AA	28.26 a
P	0.008
LSD (5%)	4.68

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

Rootstocks 125 AA and SO4 had over a quarter of their buds with more than three leaves exposed in 2009-10 (Table 1). These data are consistent with what we have observed in previous years, although the results were not always statistically significant. This indicates that vines on these rootstocks are potentially at slightly greater risk from damage from early spring frosts than vines grafted to 3309 or Schwarzmann.

Table 2. Effect of rootstock on berry weights and juice composition of Sauvignon blanc at harvest on 7 April 2010.

Rootstock	Berry weight (g)	Soluble solids (°Brix)	pH	Titratable Acidity (g/L)
101-14	2.12 bc	21.02 a	2.901	11.23
SO4	2.08 c	19.92 b	2.908	11.30
Schwarzmann	2.29 a	19.34 b	2.935	10.99
3309	2.17 abc	19.86 b	2.954	11.12
125 AA	2.22 ab	19.94 b	2.904	10.92
P	0.032	0.019	0.128	0.868
LSD (5%)	0.134	0.948	ns	ns

Means in the same column followed by the same letter are not significantly different ($P > 0.05$). ns= no significant difference

This season there were significant differences in berry weight and soluble solids (Table 2). For the past 13 seasons of data collection, fruit from vines on Schwarzmann have proven to have the lowest soluble solids of all at this site. Vines on Schwarzmann continue to have the highest berry weight of those on any of the rootstocks at this site. In eleven of the 13 seasons evaluated, vines on Schwarzmann have had the highest berry weight. It is interesting to note that, while the results were not statistically significant, vines on SO4 had the highest titratable acidity this season, as in the past two years. There were no significant differences in fruit pH among vines on any of the rootstocks.

Fruit from vines on SO4 had the highest titratable acidity this season, as in the past two years. Fruit from vines on 101-14 had the lowest pH of all, while fruit from vines on 3309 had the highest (Table 2).

Table 3. Effect of rootstock on yield and yield components of Sauvignon blanc at harvest on 7 April 2010.

Rootstock	Average yield per vine (kg)	Average number of bunches per vine	Average bunch weight (g)
101-14	7.02	60.2	116.8 c
SO4	7.96	61.3	129.7 ab
Schwarzmann	7.58	61.3	124.0 bc
3309	7.62	60.3	126.6 bc
125AA	8.23	59.4	139.3 a
P	0.165	0.979	0.002
LSD (5%)	ns	ns	10.17

Means in the same column followed by the same letter are not significantly different ($P > 0.05$). ns= no significant difference

There were no differences in yield or the number of bunches per vine this season (Table 3). However, the bunch weights were significantly different between rootstocks. Vines on rootstock 125AA had the highest bunch weights of all the rootstocks evaluated.

Table 4. Effect of rootstocks on winter pruning weights and the yield to pruning weight ratio (Ravaz index) of Sauvignon blanc, 2008-09 season.

Rootstock	Average weights of prunings per vine(kg)	Yield to pruning weight ratio (Ravaz index)
101-14	1.60 b	3.97 a
SO4	2.10 a	2.69 c
Schwarzmann	1.81 ab	3.58 ab
3309	1.88 ab	3.29 bc
125 AA	1.91 a	3.23 bc
P	0.034	0.009
LSD (5%)	0.3016	0.673

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

Pruning weights for 2008-09 were significantly different between rootstocks. In all seasons where pruning weights have been recorded, vines on SO4 have had the greatest vine vigour of any vines evaluated. The Ravaz index was also significantly different among rootstocks. The values are calculated from the 2008-09 season yield and pruning weights and vines on SO4 had the lowest yield to pruning weight ratio, while vines on 101-14 and Schwarzmann had the highest (Table 4).

4 Conclusion

Vines on Schwarzmann continue to have the highest berry weights and the lowest fruit soluble solids of vines on any of the rootstocks at this site. Vines on rootstocks 3309 and 125AA have been the top yielding vines for the past three years, although these results were not always statistically significant. SO4 continues to be the most vigorous of all the rootstocks in the trial. As we continue to evaluate these vines over the long term, we are starting to see consistencies and trends developing that can help growers to plan for a long-term strategy in the selection of rootstocks for their vineyards.

For further information please contact:

Sue Neal
The New Zealand Institute for Plant & Food Research Ltd
Plant & Food Research Marlborough
Marlborough Wine Research Centre
PO Box 845
Blenheim 7240
NEW ZEALAND
Tel: +64-3-984 4310
Fax: +64-3-984 4311
Email: Sue.Neal@plantandfood.co.nz