

Trial of alternative varieties reworked on Chardonnay in the Murray

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"Alternative varieties' has been a buzz word in the industry, but how climatically or economically suitable are these alternatives?

This trial investigated the best way to change over to an alternative variety. It also compared the performances of a range of alternative varieties with those of traditional varieties in the Murray Valley.

The trial

A trial was established at the Dareton Research Institute, near Mildura, to demonstrate the suitability of alternative varieties to this region and evaluate two methods of reworking that can be used to establish the new varieties on existing vines.

The trial site was 0.6 ha planted to Chardonnay on Ramsey in 1995. The block also contained two rows of Chardonnay on six different rootstocks used in a previous trial, giving us the opportunity to examine the effect of rootstock on the performance of the alternative varieties we tested.

The vines were planted in 3.3-m rows with 2.4-m vine spacing on a two-wire vertical trellis, and they were box-pruned.

The soil was a sandy loam varying in depth from 70 to 105 cm, with an active root depth of 40 to 75 cm. The vines were irrigated with drippers spaced every 50 cm. Nutrition was applied by fertigation and a routine foliar program.

Two methods of reworking were used: grafting a bud of the new variety into the original rootstock (mostly Ramsey) and grafting a bud of a new variety into the Chardonnay trunk (see photos). The losses were highest in vines reworked into the rootstock.



A bud grafted into the existing Chardonnay trunk being secured in place with grafting tape. Photo: Greg Moulds



A bud grafted into the existing rootstock trunk secured in place with grafting tape. Photo: Greg Moulds



The trial site, showing the two methods of grafting. Rootstocks can be seen close to the ground; Chardonnay trunks still at waist height can be seen in the background.

Photo: Greg Moulds

Grafting observations

- Savagnin and Montepulciano had the greatest number of vines that had to be re-budded because of graft failure.
- Pinot Gris, Lagrein, Pinotage, Montepulciano and Tannat suffered the most canopy roll in the first two seasons of establishment and required the most training during the season.
- In the first season, the yields of Muscat Gordo, Arneis, Pinot Gris and Montepulciano grafted into the Ramsey rootstock were less than 50% of those of the same varieties bud-grafted into the Chardonnay trunk.

Varietal growth and maturity observations

Sixteen varieties were selected for establishment (eight reds and eight whites). The varieties, which included standard varieties for comparison, were:

- **White grapes:** Arneis, Fiano, Vermentino, Sauvignon Blanc, Savagnin (formally Albarino), Viognier, and Muscat Gordo Blanco
- **Red grapes:** Pinot Gris, Graciano, Lagrein, Montepulciano, Pinotage, Tannat, Tempranillo, Shiraz and Cabernet Sauvignon.

Below is a summary of the alternative varieties tested.

Arneis

Arneis has erect growth and high vigour, with thin spindly shoots and medium-sized leaves. This variety grew well after a slow start in the first season. The fruit was spread evenly throughout the canopy and was easy to harvest. Bunches were compact, and yield was in the high range and better than expected. Bunches were very susceptible to rot damage.

ARNEIS TRIAL OBSERVATIONS		Disease susceptibility		Moderate
Vine vigour	High	Bunch compaction		Tight compact
Juice Baumé	13	Average bunch weight (g)		209
Juice pH	3.5	Fruit yield (kg/vine)		22
Juice TA (g/L)	5.9	Estimated yield (t/ha)		26.4

TA, titratable acidity



Mature Arneis leaf and ripening bunch. Photo: Greg Moulds

Fiano

This variety is erect and highly vigorous, with long shoots and large leaves. It appeared to be well suited to the Murray Valley climate. Some vines showed hen and chicken (mixed berry size) and also a second crop on the lateral shoots. Fiano had loose bunches with small berries of consistent quality and good disease resistance.

FIANO TRIAL OBSERVATIONS		Disease susceptibility		Low
Vine vigour	High	Bunch compaction		Loose
Juice Baumé	12.3	Average bunch weight (g)		149
Juice pH	8.2	Fruit yield (kg/vine)		18.4
Juice TA (g/L)	3.3	Estimated yield (t/ha)		22.1



Mature Fiano leaf.
Photo: Greg Moulds

Vermentino

Vermentino is an erect, highly vigorous variety producing long shoots with large wavy leaves. It appears well suited to Murray Valley climatic conditions. The vines have grown well in the very hot spring and summer. In our trials the variety produced the highest yield and the largest bunches of all varieties in both seasons.

VERMENTINO TRIAL OBSERVATIONS		Disease susceptibility		Low
Vine vigour	High	Bunch compaction		Loose
Juice Baumé	11.7	Average bunch weight (g)		262
Juice pH	6	Fruit yield (kg/vine)		30.0
Juice TA (g/L)	3.5	Estimated yield (t/ha)		36.0



Mature Vermentino leaf.
Photo: Greg Moulds

Graciano

This variety is erect and highly vigorous, with long canes and large leaves. It appears well suited to Murray Valley conditions. Graciano was the best red variety at establishment, losing no vines throughout the hot spring and summer. This variety produced the largest bunches of the red varieties with small berries.

GRACIANO TRIAL OBSERVATIONS		Disease susceptibility		Low–moderate
Vine vigour	High	Bunch compaction		Loose
Juice Baumé	11.1	Average bunch weight (g)		239
Juice pH	5.2	Fruit yield (kg/vine)		23.3
Juice TA (g/L)	3.7	Estimated yield (t/ha)		28.0
		Anthocyanin colour (mg/g fresh berry weight)		0.93



Mature Graciano Leaf.
Photo: Greg Moulds

Lagrein

Lagrein grew well and seems well suited to the Murray Valley conditions. The very drooping canopy has spindly, deep green canes and medium to large leaves that protect and support the fruit, which is evenly spread under the canopy. The fruit is susceptible to bunch rot in wet seasons.

LAGREIN TRIAL OBSERVATIONS		Disease susceptibility	High
Vine vigour	Medium - high	Bunch compaction	Loose
Juice Baumé	11.7	Average bunch weight (g)	179
Juice pH	6.3	Fruit yield (kg/vine)	21.0
Juice TA (g/L)	3.7	Estimated yield (t/ha)	25.2
		Anthocyanin colour (mg/g fresh berry weight)	1.2



Mature Lagrein Leaf.
Photo: Greg Moulds

Montepulciano

This variety is the latest to ripen and hence to harvest. Vines produce light crops of loose bunches that have a tough skin resistant to bunch rots. In our trial, Montepulciano produced low to medium yields of good quality fruit with good colour.

MONTEPULCIANO TRIAL OBSERVATIONS		Disease susceptibility	Low
Vine vigour	Medium	Bunch compaction	Loose
Juice Baumé	12.2	Average bunch weight (g)	144
Juice pH	6.6	Fruit yield (kg/vine)	16.7
Juice TA (g/L)	3.6	Estimated yield (t/ha)	20
		Anthocyanin colour (mg/g fresh berry weight)	1.45



Mature Montepulciano leaf and ripening bunch.
Photo: Greg Moulds

Tannat

This variety is slightly erect and highly vigorous, with long canes and medium to large leathery leaves that roll backwards. Tannat was the most difficult to train and develop a full canopy owing to its tendency to roll. Problems of excessive vigour, vine death and low yield may indicate that Ramsey is not a suitable rootstock for Tannat.

TANNAT TRIAL OBSERVATIONS		Disease susceptibility	Medium - Low
Vine vigour	High	Bunch compaction	Very tight
Juice Baumé	12.3	Average bunch weight (g)	195
Juice pH	6.3	Fruit yield (kg/vine)	11.3
Juice TA (g/L)	3.4	Estimated yield (t/ha)	15.1
		Anthocyanin colour (mg/g fresh berry weight)	1.84



Mature Tannat leaf and ripening bunch Photos: Greg Moulds

Production yields

The first-year yield was drastically reduced by botrytis infection following abnormal mid-summer rain.

On the basis of the second year's results (2011–12, Figure 6), varieties were categorised into low (purple), medium (blue) and high (orange) -yielding.

The lowest-yielding varieties were Pinot Gris, Tannat and Montepulciano. In general, the yields obtained would be considered lower than district averages for similar red varieties.

Tannat and Pinot Gris produced low yields owing to poor canopy development, and they seemed to suffer from waterlogging of the soil and the root zone.

The medium-yielding varieties included Fiano and Tempranillo; they produced yields comparable to that of Cabernet Sauvignon. There was no reduction in Fiano yield through bunch rot.

Of the remaining, high-yielding varieties, Graciano and Vermentino had the lowest percentages of fruit with sunburn or fruit rot.

Rootstocks

In addition to being planted on Ramsey, Pinot Gris and Fiano were reworked into the trunks on the following rootstocks: Ramsey, Schwarzmann, Ruggeri 140, K51-40 and SO4.

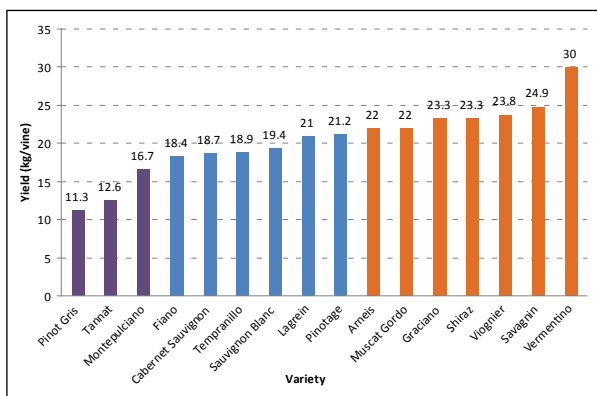


Figure 6. Average yields (in kg/vine) in the second year of the trial (2011–12) at Dareton for all varieties.

Our observations revealed that Fiano was a vigorous variety. Careful consideration is therefore required in selecting a suitable rootstock for this highly vigorous variety. In our early results the Fiano yield did not differ significantly among the different rootstock selections (see Figure 7).

Pinot Gris yield differed by 88% (Figure 8) between the best and worst rootstock combinations, suggesting that a highly vigorous rootstock is important for this variety.

Not enough vines were measured to reliably assess rootstock combinations, so rootstock choices should not be based on these early results.

Some suggestions to consider

- Reworking of alternative varieties directly into the Chardonnay vines on the Ramsey rootstock has been successful.

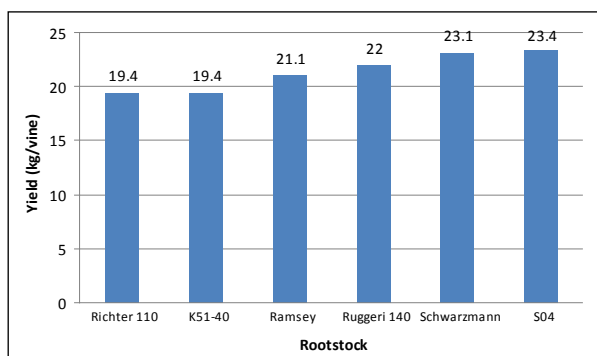


Figure 7. Fiano yields on different rootstocks in 2011–2012

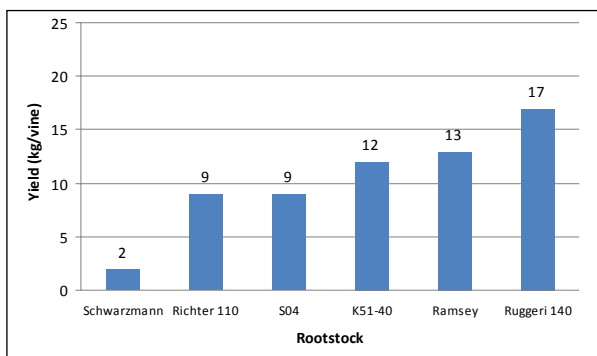


Figure 8. Pinot Gris yields on different rootstocks in 2011–2012

- Muscat Gordo, Tannat, Montepulciano and Shiraz reworked directly onto the Ramsey rootstock performed poorly.
- Cropping levels returned two seasons after the reworking.
- From observations over the past two seasons we can make the following conclusions:
 - Fiano, Vermentino and Graciano are the varieties most suited to the area. Graciano has performed very well and is a good prospect for the Murray Valley.
 - Fiano appears to be suitable for use with lower vigour rootstocks, although more work will be required to confirm this observation.
 - Graciano required more water applications from veraison till harvest to maintain fresh fruit in good physical state.
 - Sauvignon Blanc, Savagnin, Arneis, Lagrein and Tempranillo are considered less suitable because of the high costs associated with managing vegetative growth and the susceptibility of these varieties to bunch rots.

Acknowledgments

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