



The 15th Australian Wine industry
technical Conference
Sydney, NSW
13-18 July 2013

MEASURES OF QUALITY FROM THE VINEYARD TO THE WINERY

**Finding relationships between BSA (Berry
Sensory Assessment) and wine quality.
Case study – Shiraz /Rootstocks**

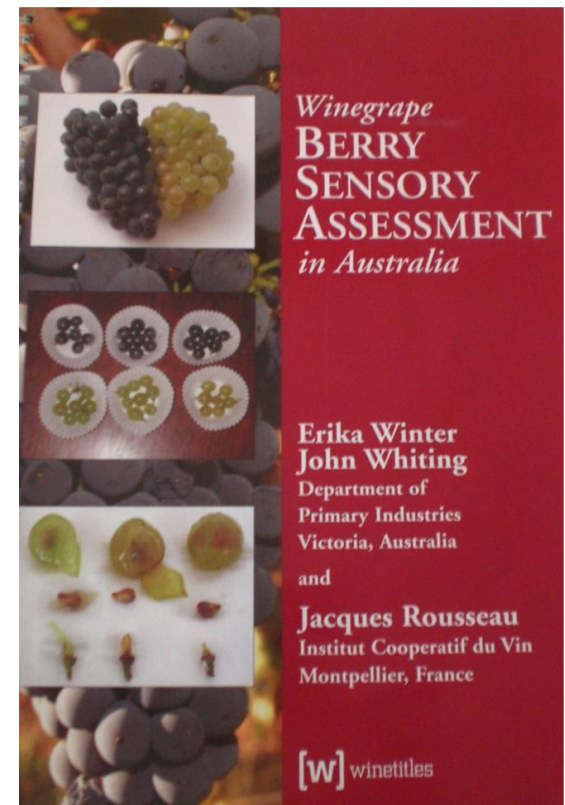
Sandra Milena Olarte Mantilla



What is BSA?

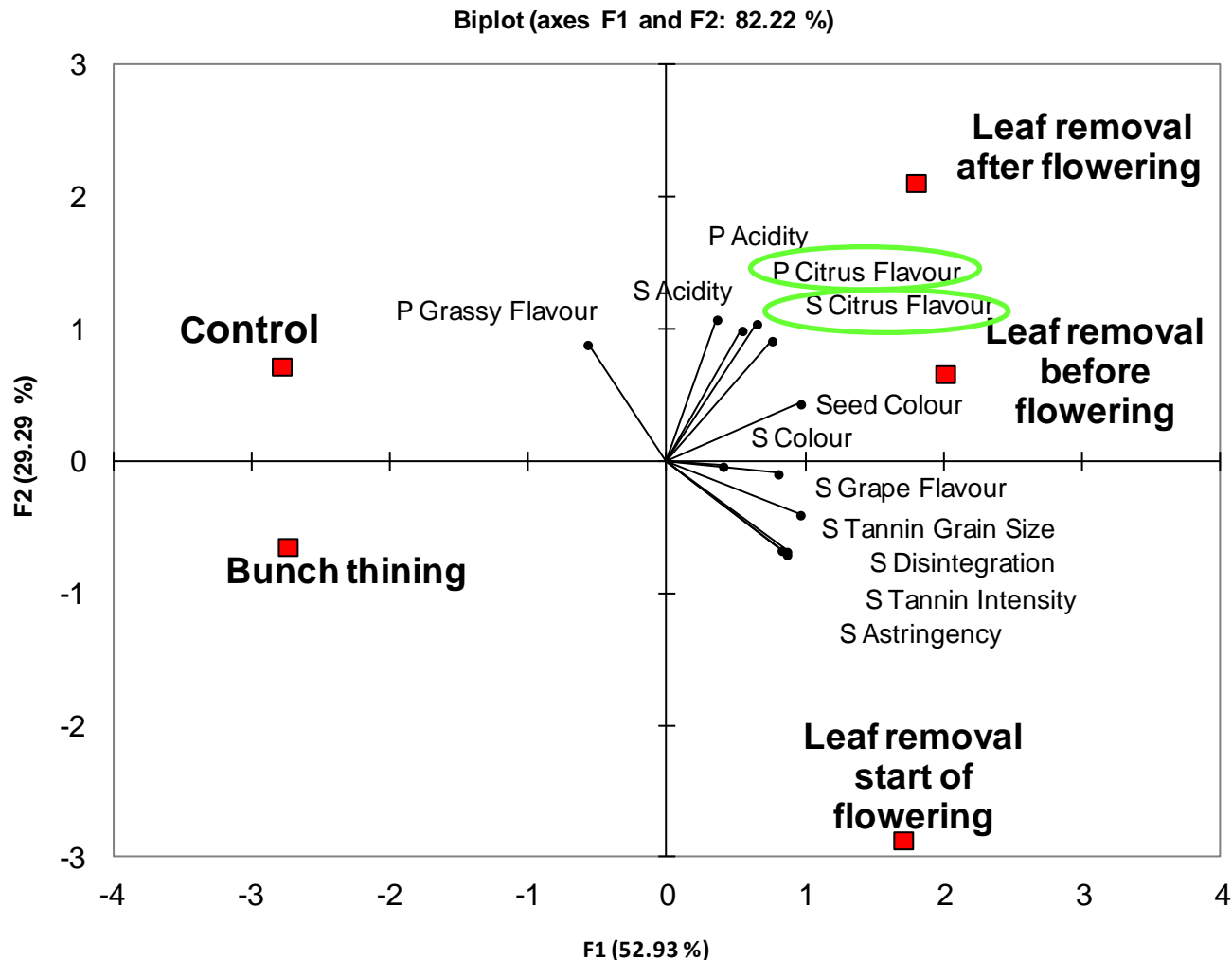
BSA: any form of visual, aroma or taste evaluation of wine grape berries. This could involve evaluation of berry colour, aroma and the flavour, taste and mouth feel of some/all berry parts.

- First BSA methodology from Institut Cooperatif du Vin (ICV) was the Quantified Descriptive Sensory Analysis (QDSA) presented by Jacques Rousseau in 2000 and in Australia in 2004



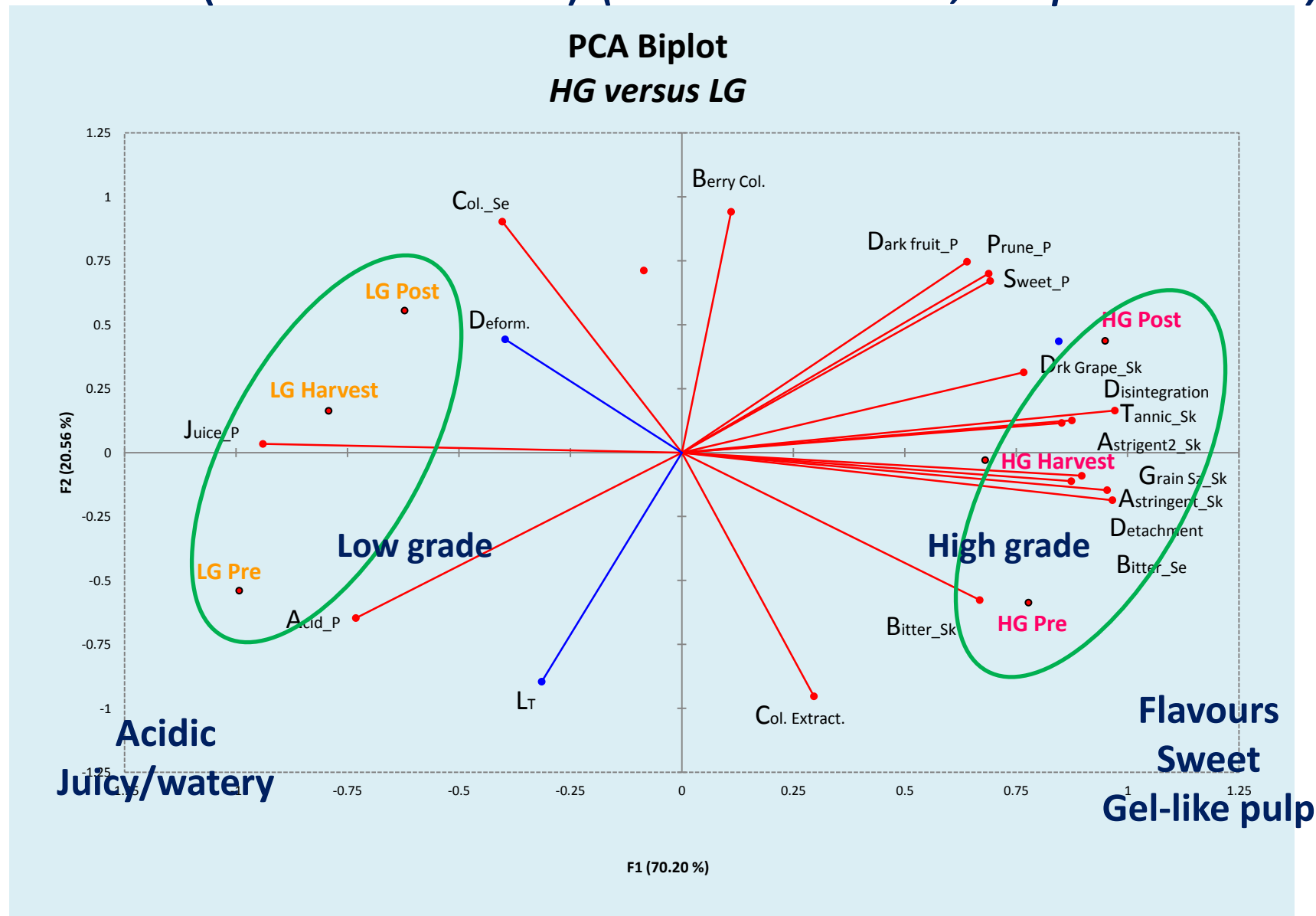
BSA studies in viticulture

- Shiraz in McLaren Vale, (*D.V.C.S, 2006*)
- Semillon in Waite campus (*Lohitnavy et al, 2009*)



Grape berry sensory evaluation, Shiraz

- Results (HG versus LG) (*Jordans et al, unpublished*)



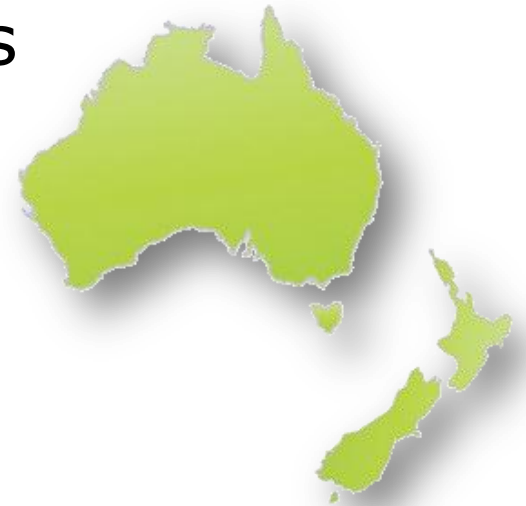
PhD Project Aims

- Determine extent of use of Berry Sensory Assessment in Australia by wine grape growers and wine makers.
- Determine if sensory differences in berries and wine can be found between rootstocks.
- Determine and understand relationships between Berry Sensory Assessment and wine quality.

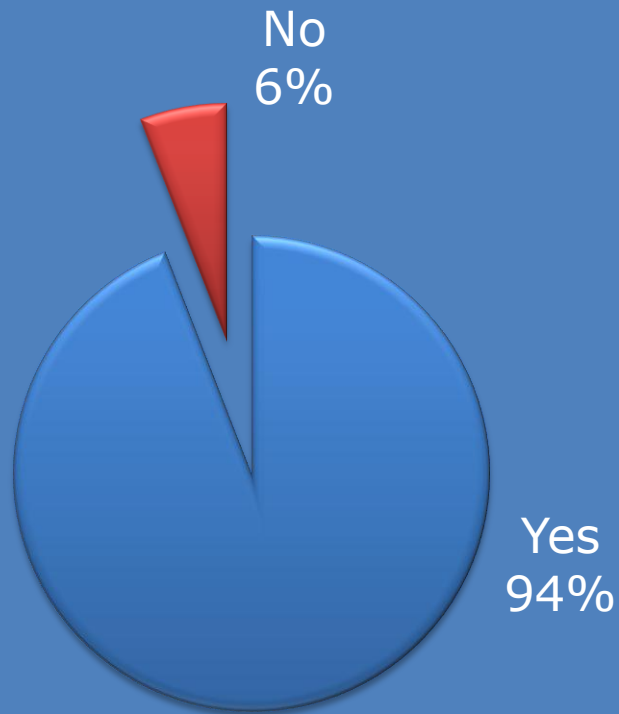


Survey Methodology

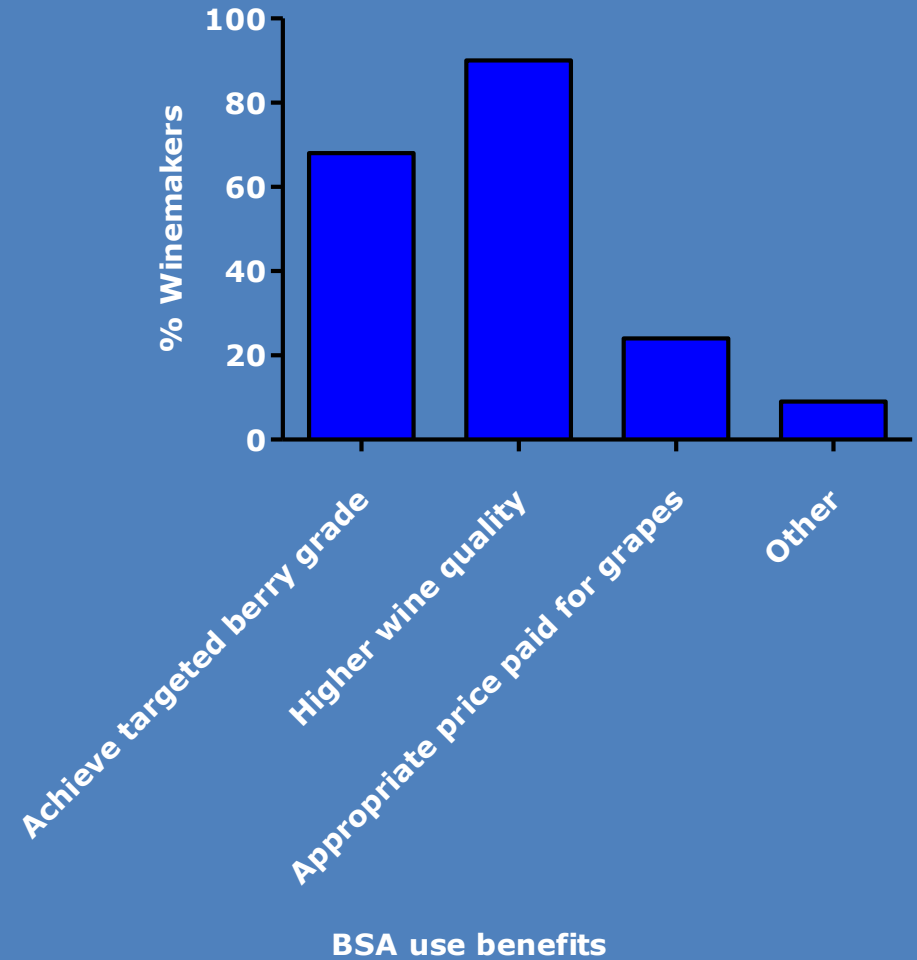
- Winemakers survey
 - 25 questions
 - 2150 Australian winemakers
 - 481 New Zealand winemakers
 - 347 answers
- Grapegrowers survey
 - 8 questions
 - 70 answers
 - 6 regions in South Australia



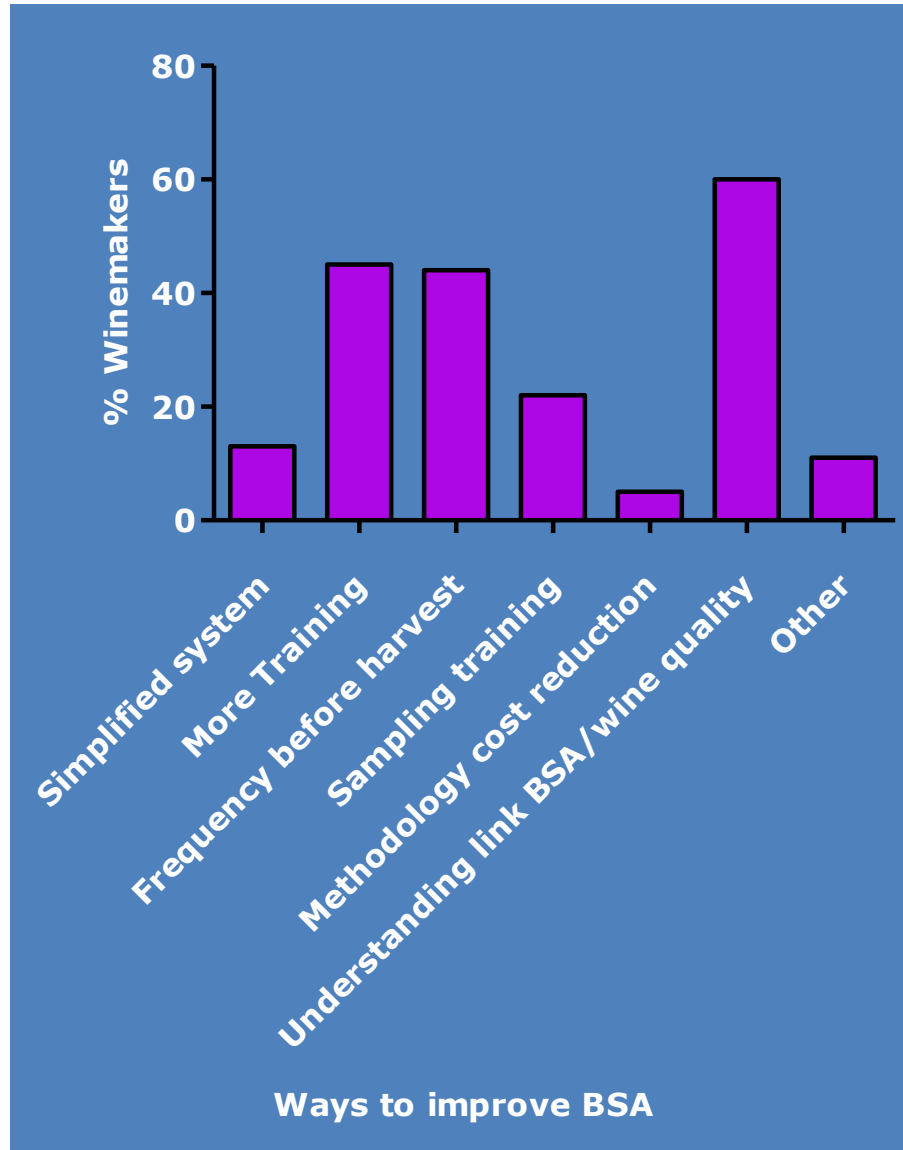
Winemakers Survey Results



Winemakers using BSA



Winemakers Survey Results



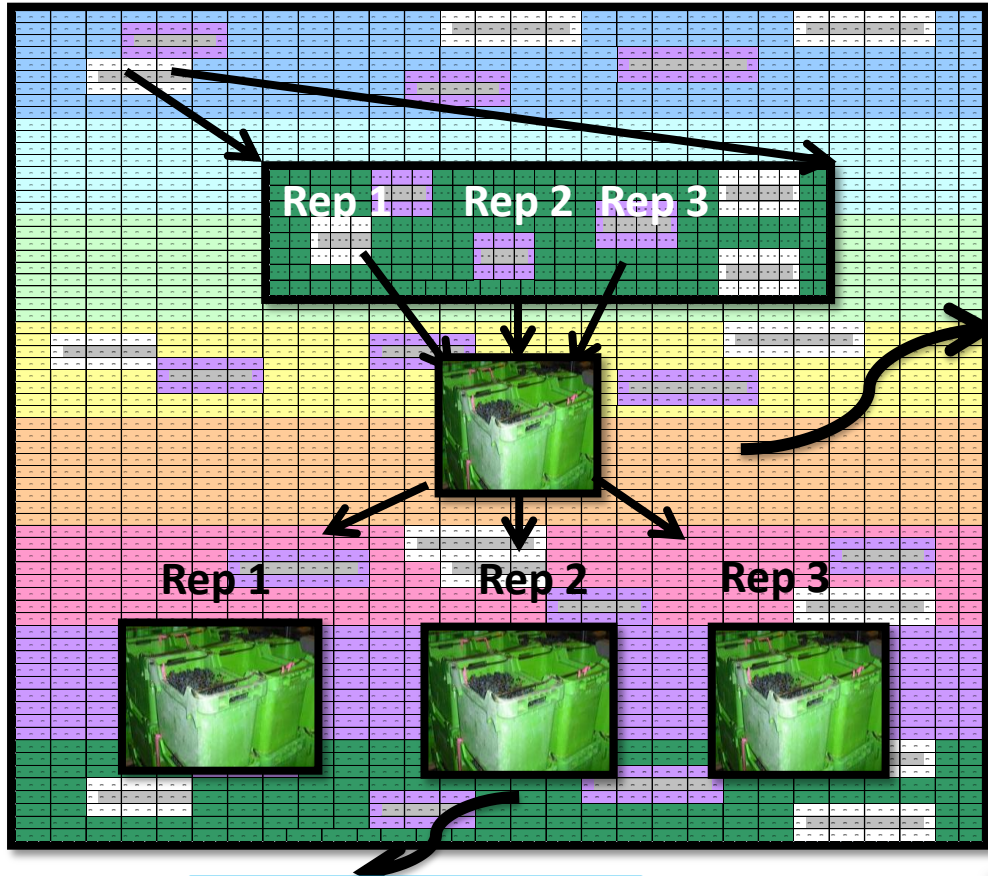
Rootstocks

- Resistance to Phylloxera, drought tolerance, influence scion vigour, nematode tolerance and salinity tolerance
- Use of rootstocks in South Australia 20% (*Dry. N. 2007*), Australia 15%
- Potential Phylloxera resistance breakdowns (*Schmid et al. 2003*)
- High implementation costs and production loss ~AUS\$ 20.0000 ha (*DAFWA,2006*)
- Studies evaluating use of rootstocks on sensory characteristics are scarce and often only evaluating wine quality scores (*Walker et al.2000, Silvilotti, 2007*)

What is the effect of rootstocks on Shiraz berry and wine sensory characteristics?

Methodology

SARDI Nuriootpa,
Barossa Valley



Rootstocks Berry and Wine Descriptive Analysis

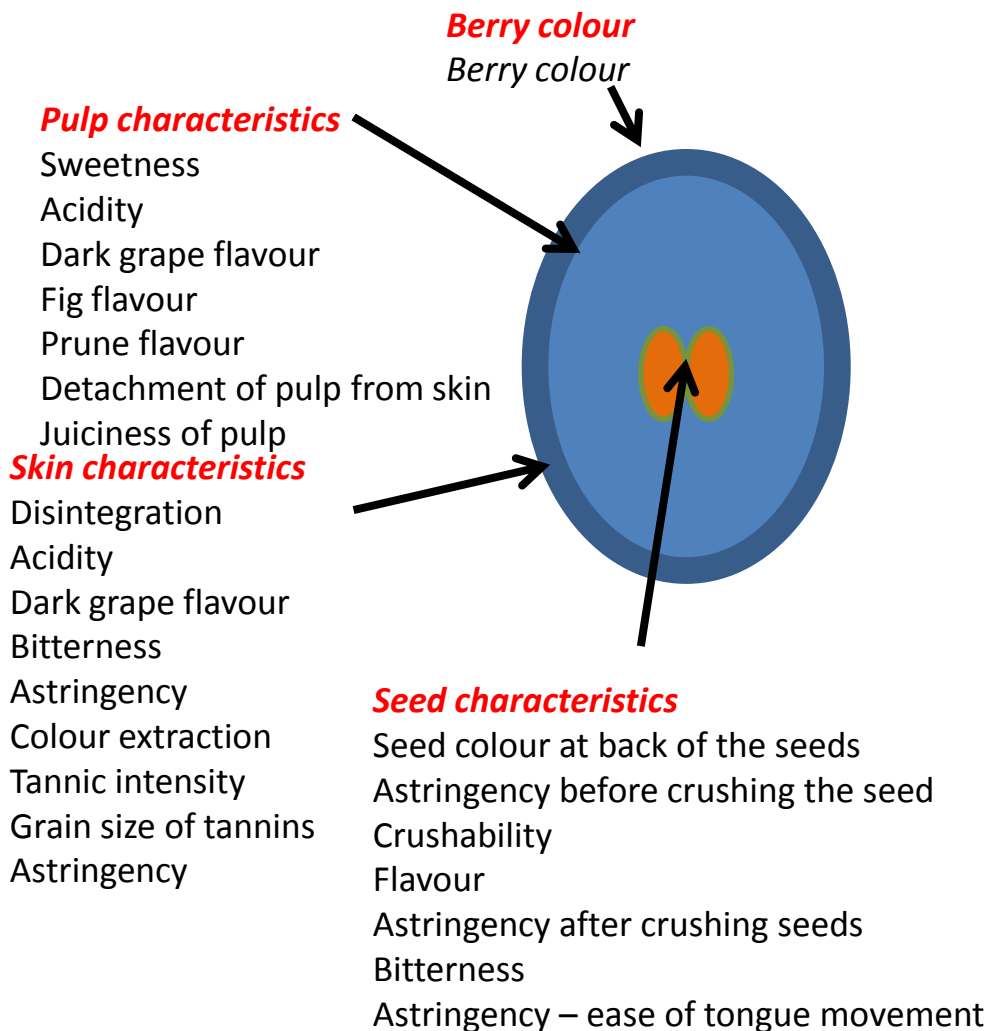
	Fresh berries	Wine
Panel size and technique	Descriptive analysis 12 trained panellist	
Sample size	3 berries	30 mls
Grape variety	Shiraz, clone BVRC30	
Rootstock trials	Own roots 110 Richter 1103 Paulsen Schwarzmann	
Collection years	2010 & 2011	
Number of attributes assessed	24	26



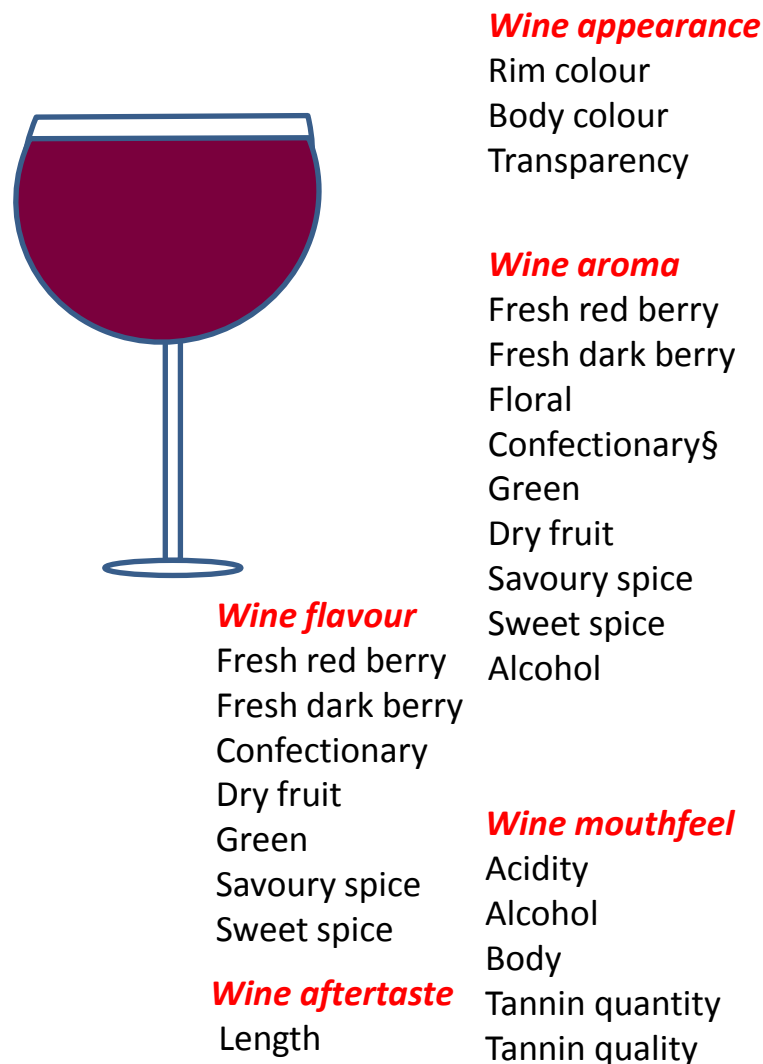
Wine quality rating 0 – 20
wine show system
Expert panel 12 assessors

Sensory attributes wine and berry

Berry Sensory Attributes



Wine Sensory Attributes



Vine, grape and wine compositional measurements



Vegetative vine measurements:

Yield

Berry weight

Pruning weights



Grape compositional measurements:

Berry tannins (Whole berry homogenate, spectrophotometry)

Anthocyanins (Whole berry homogenate, spectrophotometry)

Juice (°Brix, T.A., pH)

Trace element analysis (ICP)



Wine compositional measurements: Anthocyanins and tannins (HPLC)

pH, T.A, Alcohol

Trace element analysis (ICP)

Wine expert panel

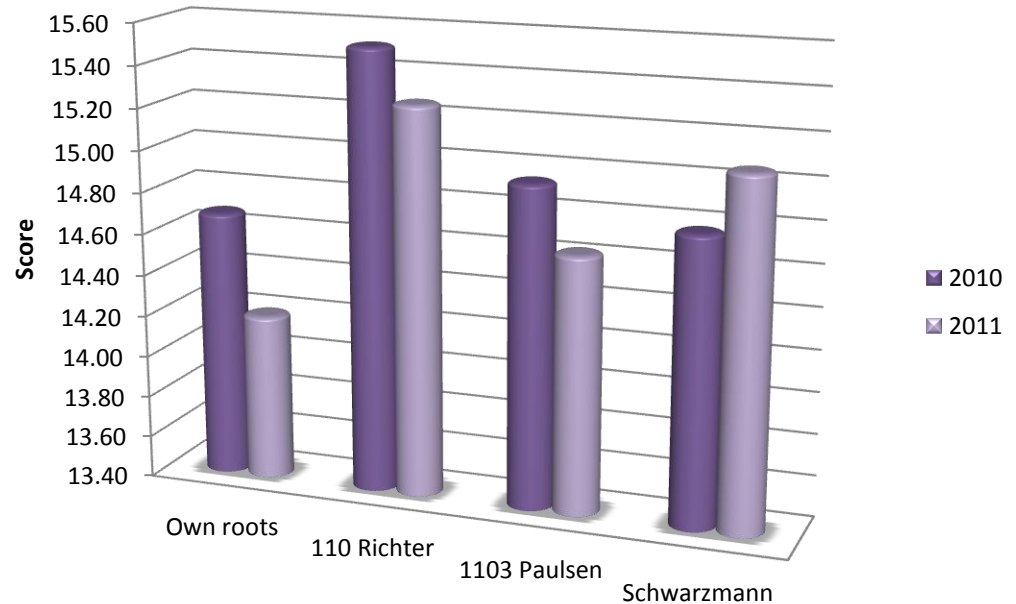
Bronze medal
2010

Bronze medal
2011

Bronze medal
2011



Wine quality



Berry and Wine compositional measurements highlights 2010 - 2011

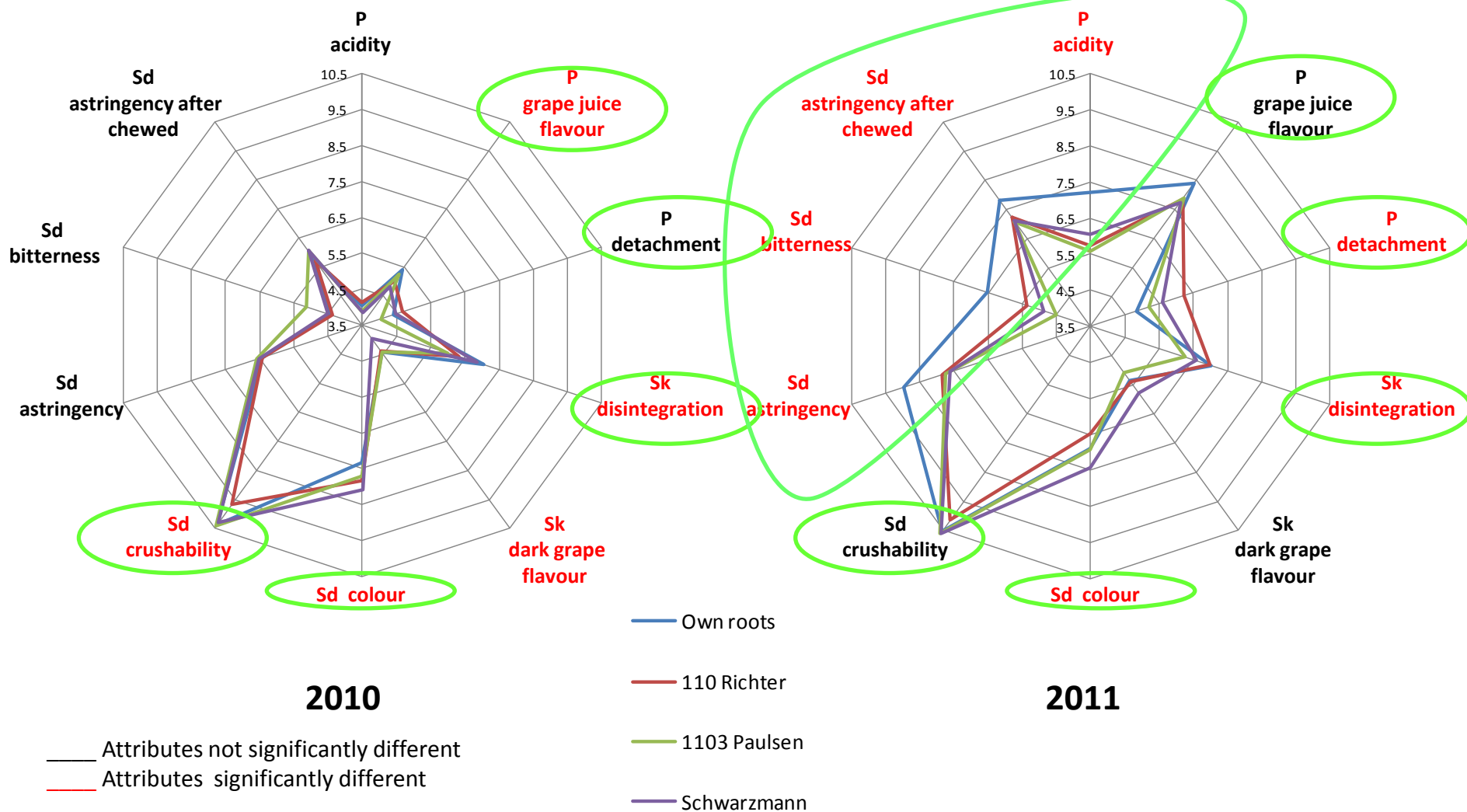
Berry

- 110 Richter and Schwarzmann: high berry colour and berry tannins
- Own roots: Higher yield, pruning weights.
Lowest magnesium and highest sodium.
High % seed tannin
- 1103 Paulsen and 110 Richter: highest % skin tannin
- No significant difference in TSS in the rootstocks in the same year

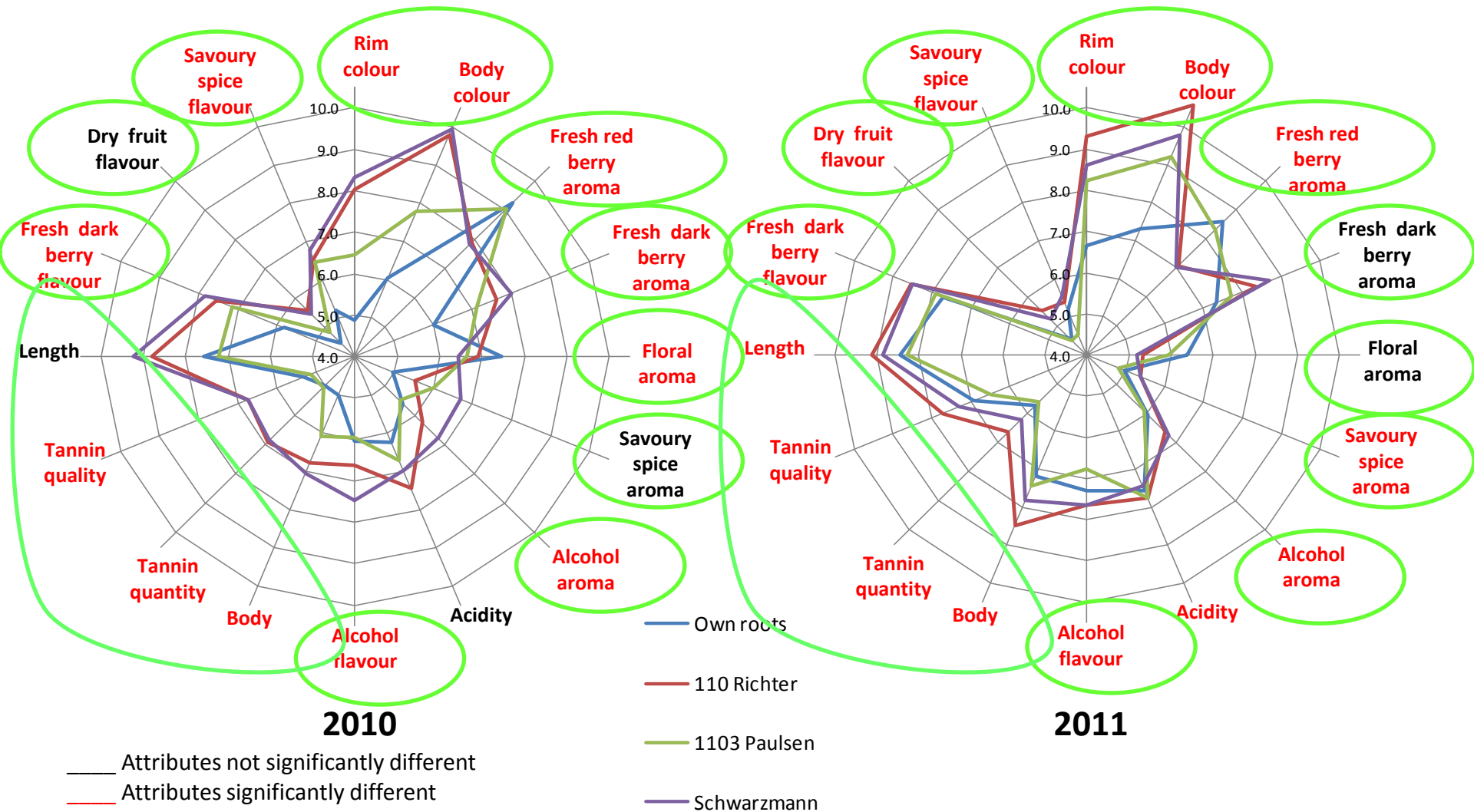
Wine

- 110 Richter and Schwarzmann: higher anthocyanins and tannins
- Own roots: Lower anthocyanins and tannins
Lowest magnesium and highest sodium
High Potassium in both years

Berry Sensory Attributes Significantly Different 2010-2011

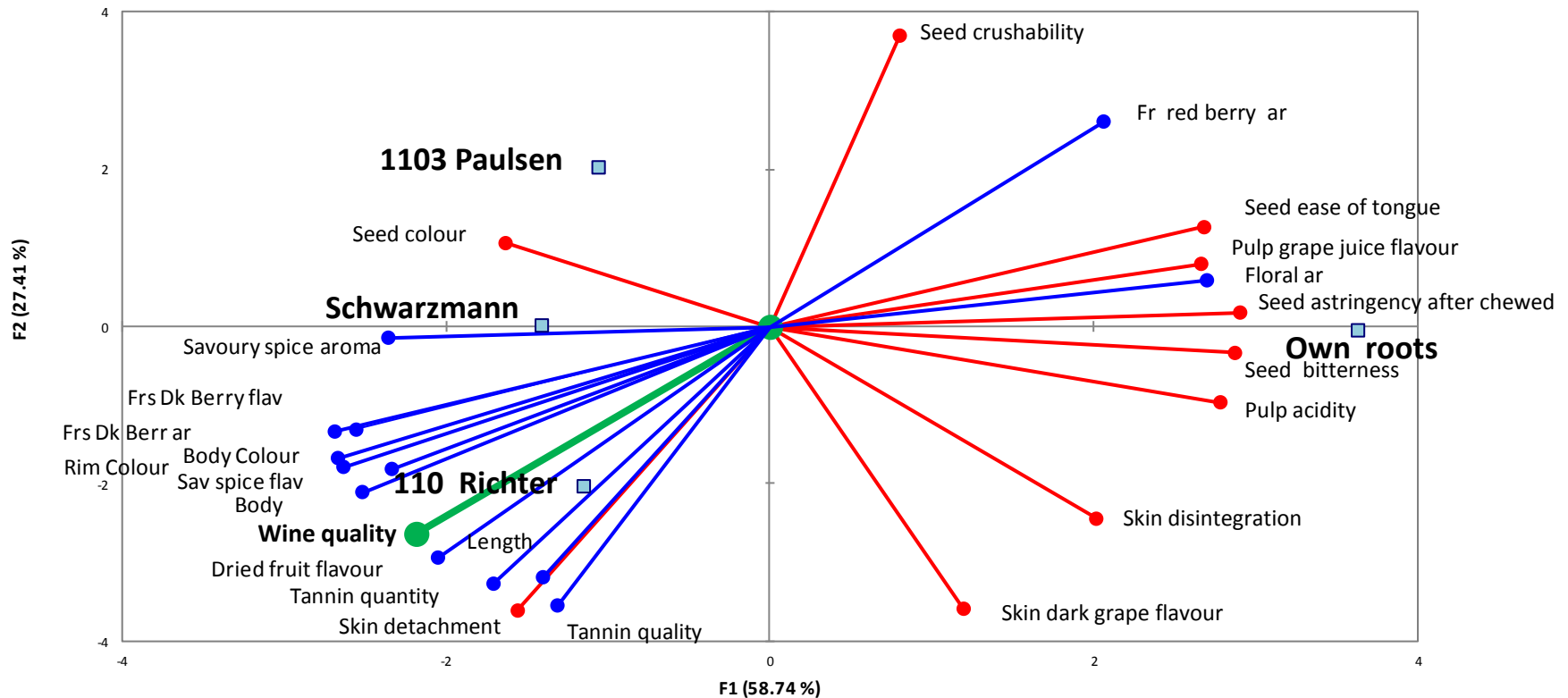


Wine Sensory Attributes Significantly Different 2010-2011



Berry and wine sensory attributes significantly different 2010 and 2011 plus wine quality

Biplot (axes F1 and F2: 86.14 %)



- Wine quality score
- Significantly different berry sensory attributes
- Significantly different wine sensory attributes

Conclusions

- Descriptive Analysis was able to differentiate rootstock treatments sensory characteristics in wine and berries. However Descriptive Analysis was able to differentiate the rootstocks more in wine.
- Own roots wine treatment had lower quality scores in both seasons. Possibly driven by high vigour and higher presence of Na in wine and berries, and K in wine.
- Wine sensory characteristics such as: dark fruit (flavour and aroma), tannin quality, tannin quantity and body are the sensory attributes that are driving higher quality for 110 Richter and Schwarzmann.
- The berry sensory attribute 'skin detachment' is related positively with wine sensory attributes that are driving the wine quality.
- Berry sensory attributes from the seeds have negative relationship to wine sensory attributes that are driving the wine quality.

Future Directions

- Studies in different varieties
- Studies with different grape grades
- Studies to find specific attributes for different wine styles



Thank you!!

- Survey participants
- Sensory assessors
- Expert panel participants
- Colleagues Bastian and Collins Group
- Supervisors

Dr Susan Bastian

Dr Cassandra Collins

Dr Patrick Iland

