

Effects of rootstock selection on finished wine from mature high-grade Pinot Noir clone 114 vines

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Overview

- Introduction
 - The Australian Wine Industry and Phylloxera
 - Current understanding of rootstocks
- Project methodology
 - Grape selection
 - Fermentation procedures
 - Analysis and evaluation

Phylloxera & Australia

- Grape phylloxera (*Daktulspaira vitifoliae*)
 - Destroys *Vitis vinifera* vines by feeding on roots
- Found in Geelong in 1877 (PGIBSA, 2003)
- Current PIZ's (Vinehealth Australia, 2016)
 - Victoria
 - North East, Maroondah, Nagambie, Mooroopna, Upton and Whitebridge
 - New South Wales
 - Sydney region and Albury

Rootstocks

- American native vines developed evolutionary resistance to phylloxera
- Grafting of common, desirable grape varieties on to tolerant rootstocks is only current strategy for phylloxera tolerance
- Main rootstock parentages (Whiting, 2003)
 - *Vitis riparia* x *Vitis rupestris*
 - Low drought tolerance, low to moderate vigour, associated with quality wine production
 - *Vitis berlandieri* x *Vitis riparia*
 - Moderate drought tolerance, good grafting affinity
 - *Vitis berlandieri* x *Vitis rupestris*
 - Vigorous, good drought tolerance, long vegetative cycle

Rootstock Selection

- Rootstock selection depends on many factors (Goldammer, 2013)
 - Climate
 - Soil type
 - Preferred vineyard management style
 - Grape varieties to be grafted

Schwarzmann

- *Vitis riparia* x *Vitis rupestris* (Goldammer, 2013)
- Not ideal in drought conditions
- Improves fruit set
 - Consistently higher berry count
- Poor sugar to acid relationship under water stress
- Higher juice pH

Schwarzmann Process

Data

INCOMING WEIGHT	355kg
DESTEM WEIGHT	321.5kg
AVERAGE BUNCH WEIGHT	73.2g
AVERAGE BERRY COUNT	105.8
AVERAGE BERRY WEIGHT	0.8591g
START BAUME	13
START pH/TA	3.55/8.28g/L
START MALIC ACID	1.89g/L

Schwarzmann Faults



140 Ruggeri

- *Vitis berlandieri* x *Vitis rupestris* (Goldammer, 2013)
- Moderately vigorous
- Long vegetative cycle, delayed ripening
- High phylloxera resistance
- Moderately drought tolerant

140 Ruggeri Process Data

INCOMING WEIGHT	357.5kg
DESTEM WEIGHT	318.5kg
AVERAGE BUNCH WEIGHT	58.8g
AVERAGE BERRY COUNT	94.5
AVERAGE BERRY WEIGHT	0.8733g
START BAUME	12.6
START pH/TA	3.53/8.88g/L
START MALIC ACID	2.81g/L

140 Ruggeri Faults



1103 Paulsen

- *Vitis berlandieri* x *Vitis rupestris* (Goldammer, 2013)
- Vigorous
- Extremely long vegetative cycle
- Prefers drought conditions

1103 Paulsen Process

Data

INCOMING WEIGHT	294.5kg
DESTEM WEIGHT	264kg
AVERAGE BUNCH WEIGHT	46.75g
AVERAGE BERRY COUNT	56.6
AVERAGE BERRY WEIGHT	1.05g
START BAUME	13.1
START pH/TA	3.48/9.05g/L
START MALIC ACID	2.83g/L

1103 Paulsen Faults



Bunch Architecture



Schwarzmann



140 Ruggeri



1103 Paulsen



Intent of Research

- Is there a detectable difference between rootstocks
 - Physical
 - Chemical
 - Sensory
- Does this have an effect on perceived quality?
 - Benchmark testing

Materials and Methods

- Grape selection
 - Considered an established premium site for Pinot Noir
 - Upper Yarra Valley
 - East facing slope
 - 330m elevation
 - Entire vineyard planted on rootstock in 2001
 - Block 8 – Pinot Noir clone 114 on three rootstock variants
 - 140 Ruggeri
 - 1103 Paulsen
 - Schwarzmann

Materials and Methods

- Harvest
 - Four pre-selected rows hand-picked simultaneously into individual half-tonne solid bins
- Processing
 - 12 hour cold stabilisation at 13 degrees
 - Destemmed into individual solid bins
 - Standard addition of PMS and pectolytic enzyme
 - 48 hour cold soak at 15 degrees
 - Given ferment codes
 - 17PIN18
 - 17PIN19
 - 17PIN20

Materials and Methods

- Primary Fermentation
 - Warmed to 21 degrees
 - Inoculated with Laffort Zymaflore X-Pure yeast strain
 - Daily hand plunge
 - Four day extended maceration post-Bé dry
 - Pressed off skins with basket press
- Transfer to barrel
 - 5 year old barriques
 - Each filled to 190L
 - Topped to 225L with 17PIN01
 - Neutral own-rooted Pinot Noir clone 114

Materials and Methods

- Secondary Fermentation
 - Currently undergoing malolactic fermentation in barrel
 - Sulphur addition will be made at completion
- Post-Fermentation
 - Will be left in barrel for a 6 month maturation period
 - Each barrel will be bottled independently

Physical Observations

- Vineyard observations
 - Response to water
 - Vine health during season
 - Relative canopy vigour
- Fruit observations
 - Degree of shrivel
 - Indications of fruit set
 - Bunch architecture
 - Bunch weight (average, 20 bunches)
 - Berry count (average, 20 bunches)
 - Berry weight (average, 100 berry from 20 bunches)

Chemical Analysis

- Berry analysis
 - Potassium of pulp and skins
 - YAN
 - Bé, pH, TA
- Ferment analysis
 - Daily Bé and temperature during primary
 - Bé, pH and TA at completion of primary
 - Malic acid
- Finishing analysis
 - pH, TA and VA
 - Residual sugar
 - Alcohol

Finishing Analysis

Schwarzmann	140 Ruggeri	1103 Paulsen
3.53	3.60	3.59
6.93g/L	6.42g/L	6.94g/L

Sensory Analysis & Benchmarking

- Preference tasting of grapes and active ferments
 - Ranked in order from 1 = most preferred to 3 = least preferred
- Full sensory analysis to be conducted on bottled wine
 - Triangular tasting
 - Single, double and triple blind tasting
 - Descriptive tasting
- Benchmarking
 - Presented to conference for tasting against other wines of high or premium perceived quality

SENSORY ANALYSIS

- Preference among producers when blind and double blind tasting has consistently been for the wines made from 140 Ruggeri or 1103 Paulsen
 - Attitudes towards Schwarzmänn wine were negative, with comments of “over-ripe” and “stewed”
- Preference among retail staff and consumers when blind and double blind tasting has been Schwarzmänn with a preference of 75%
 - Comments of “earthy” , “rich” and “fruity” for this wine, comments of “too acidic” and “not very fruity” for other two wines

References

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