

Storage of wine under different cork closures

by Berlia Roux

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Background



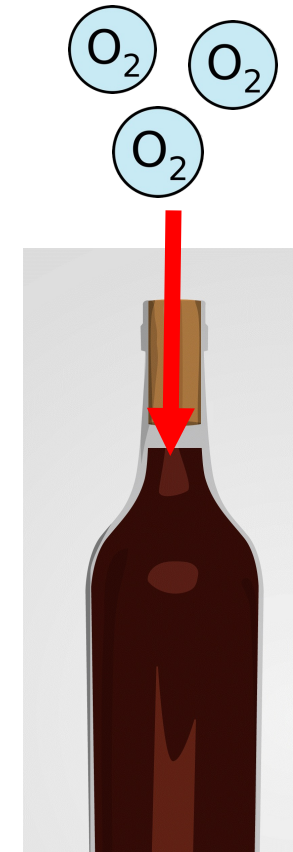
- Natural cork – from *Quercus suber*
- Decrease in usage (disadvantages like cork taint, variability & fragility)
- Today: Large variety of closures available
- Technical cork, synthetic closure, screw cap etc.



Background

OTR (Oxygen Transmission Rate):

- Transfer of oxygen from the outside to the inside of the bottle through the closure.
- Too low OTR: reductive aromas (rubbery aroma)
- Too high OTR: oxidative aromas (nutty/sherry aroma)



Gap in knowledge?

1. New closures that differ in terms of OTR = technological closures
2. Little research on comparing these closures to each other
3. No closure studies on SA cultivated wines



Aim & Objectives

AIM:

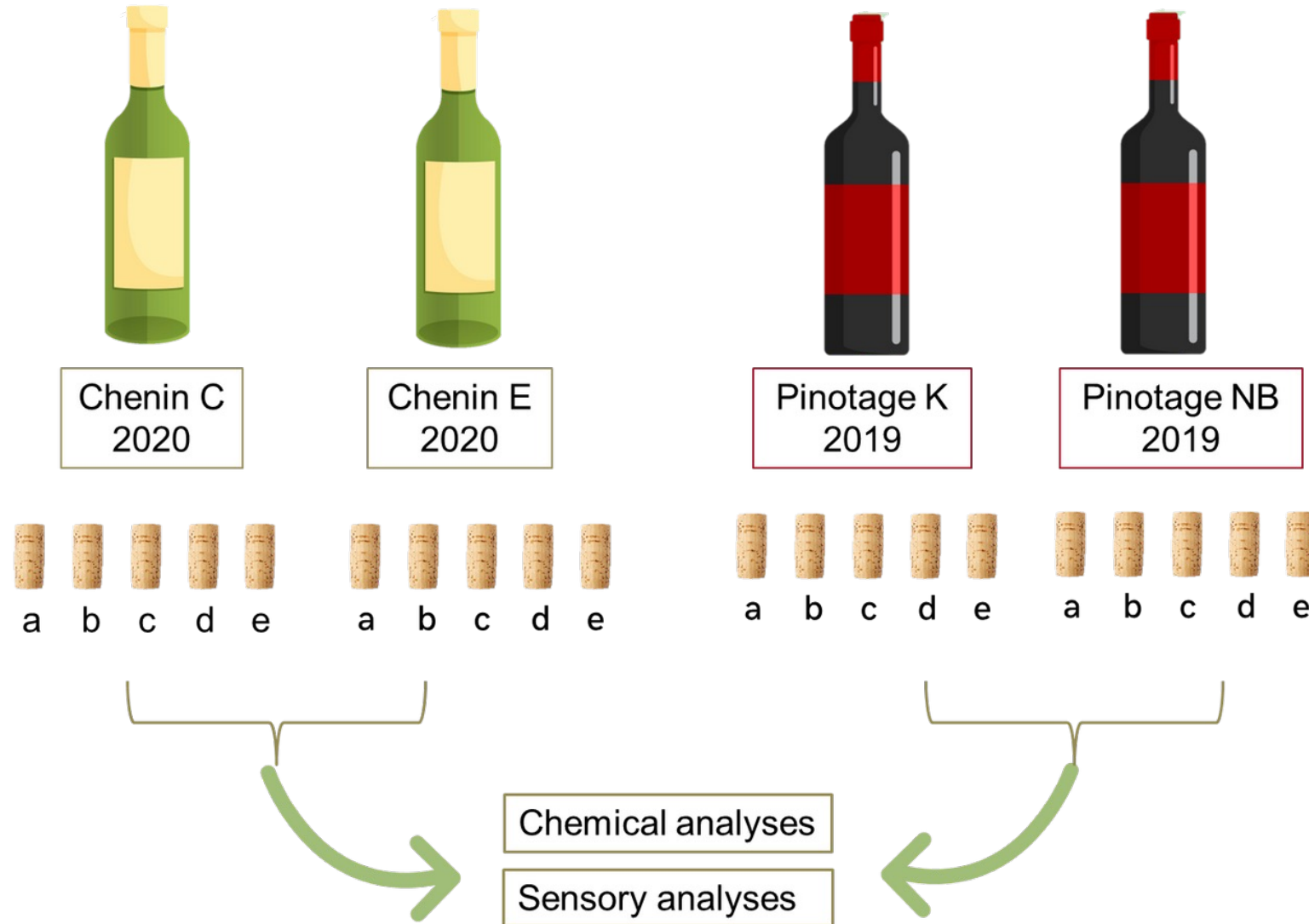
To determine the effect of different cork closures, on the evolution of South African Chenin Blanc and Pinotage wines over a period of 30 months.

OBJECTIVES:

1. To investigate the changes in the chemical compositions of four wines under five different corks.
2. To compile and compare the sensory profiles of four wines under five different corks.



Experimental design

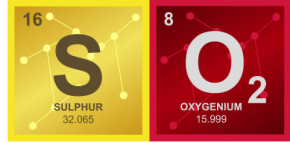
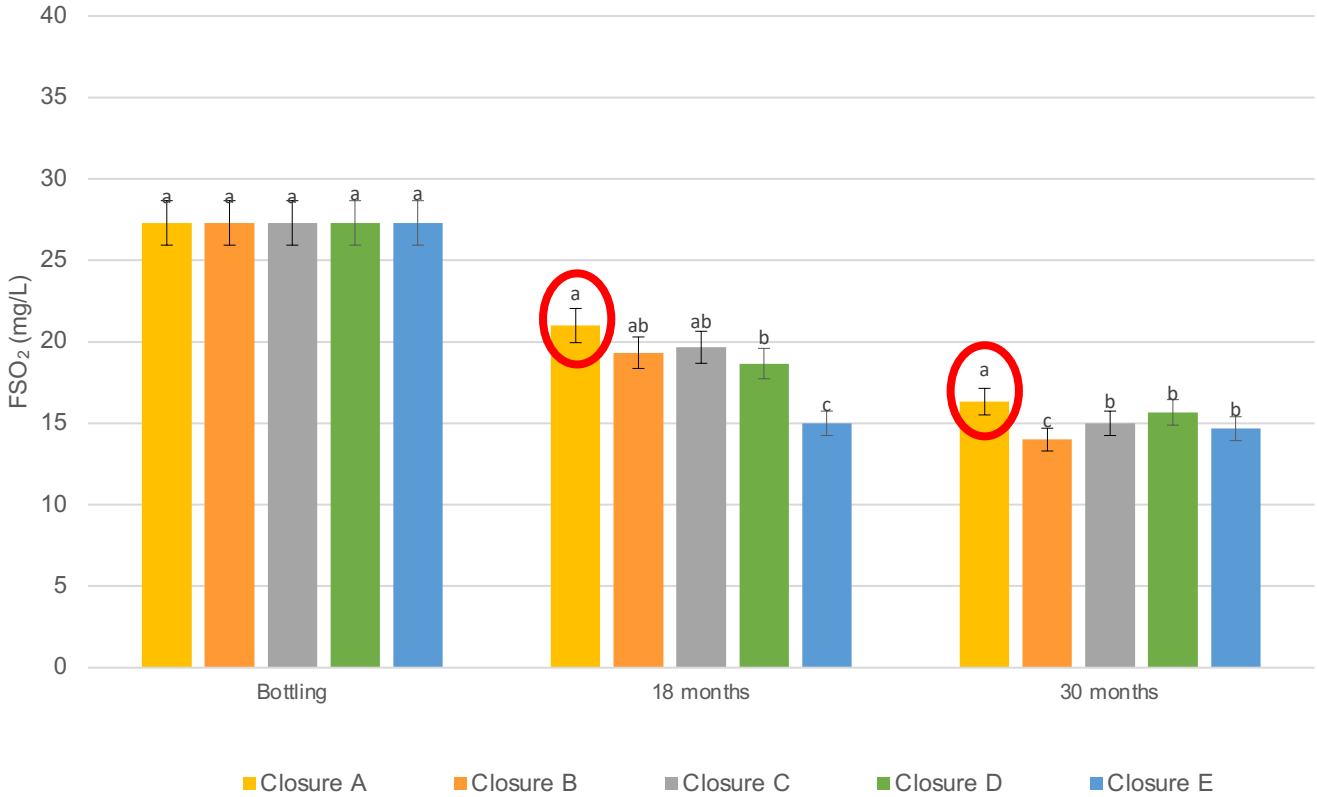


Closure A –
Low OTR

Closure B,C,D –
Moderate OTR

Closure E –
Natural cork

Free SO₂



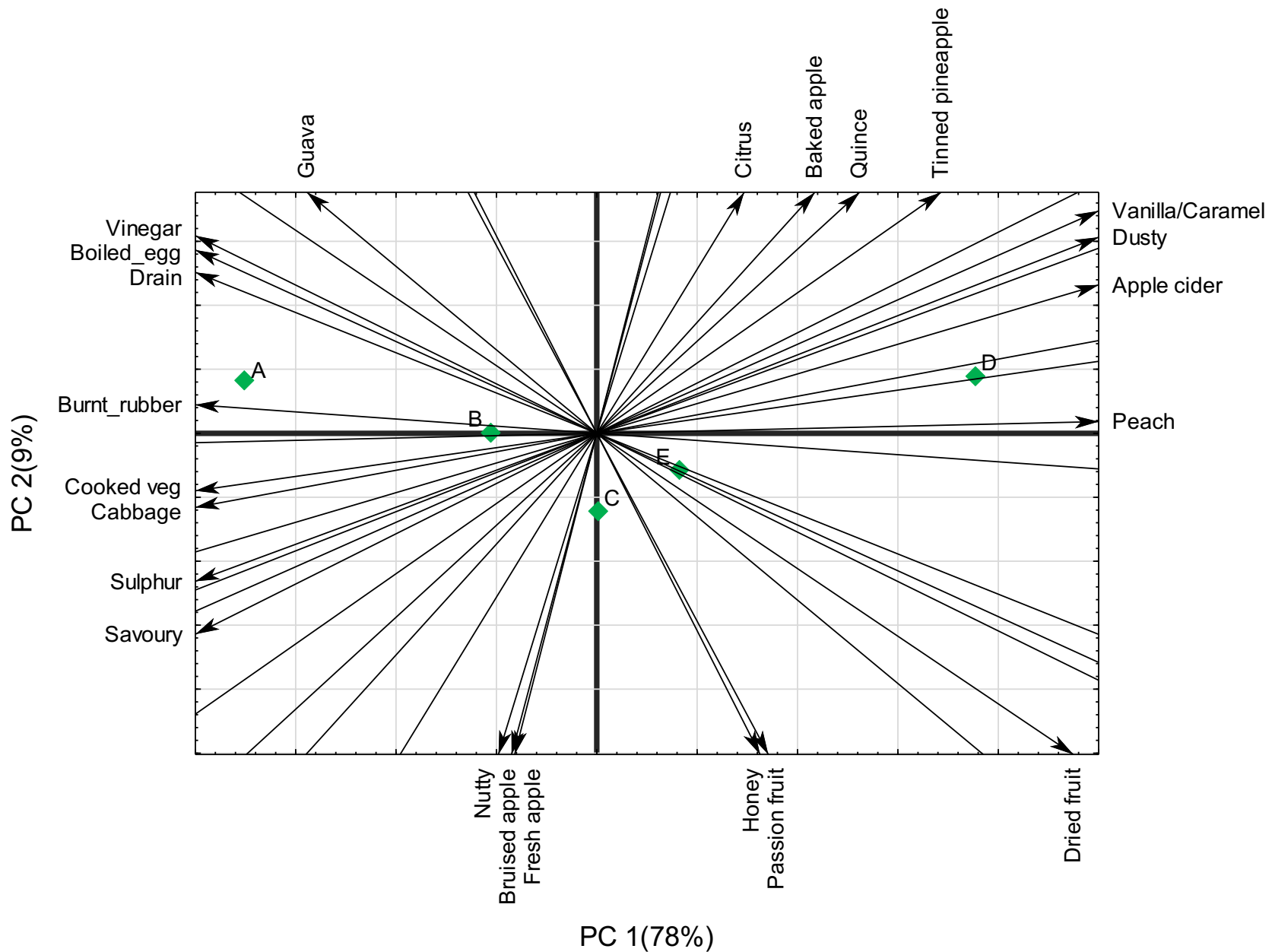
Chenin blanc E

- Closure A – Low OTR
- Closure B,C,D – Moderate OTR
- Closure E – Natural cork

Reductive compounds

Perception threshold	Compound	Closure A (Low OTR)	Closure B (Moderate)	Closure C (Moderate)	Closure D (Moderate)	Closure E (Control)	Descriptors
1.1-1.6 µg/L	H ₂ S (µg/L)	4.07 ^a	3.50 ^b	3.14 ^c	2.91 ^{bc}	2.74 ^c	Boiled or rotten egg
1.8-3.1 µg/L	MeSH (µg/L)	5.74 ^a	4.93 ^b	5.02 ^b	4.56 ^b	4.41 ^b	Burnt rubber, sewage, cabbage
25 µg/L	DMS (µg/L)	38.28 ^a	37.85 ^{ab}	37.45 ^{ab}	36.27 ^b	37.35 ^{ab}	Boiled cabbage, asparagus

Chenin blanc E

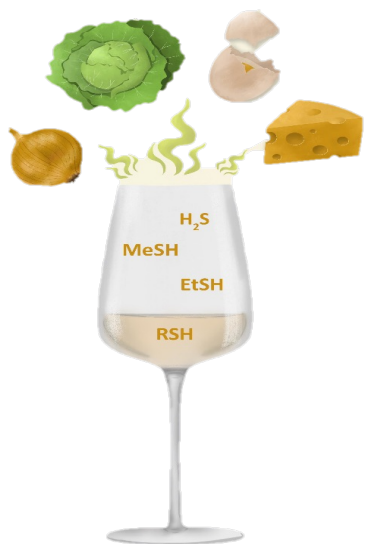


Chenin blanc E

After 30 months of bottle ageing

Closures A-E

Chenin blanc E
After 30
months
Closures A-E



Chenin blanc E					
Significant descriptors	Closure A (Low OTR)	Closure B (Moderate)	Closure C (Moderate)	Closure D (Moderate)	Closure E Control
Peach	10,21 ^b	9,51 ^b	15,50 ^{ab}	19,62 ^a	14,10 ^{ab}
Drain	14,57 ^a	8,59 ^b	6,17 ^{bc}	1,08 ^c	3,62 ^{bc}
Burnt rubber	15,62 ^a	8,51 ^b	10,46 ^{ab}	4,68 ^b	7,81 ^b
Cabbage	8,54 ^a	6,22 ^a	4,74 ^a	0,48 ^b	5,46 ^a
Boiled egg	14,41 ^a	4,70 ^b	4,21 ^b	0,00 ^b	4,74 ^b

Expected outcomes

1.

Gain knowledge on the effect of different cork closures on the chemical and sensory profile of South African wines.

2.

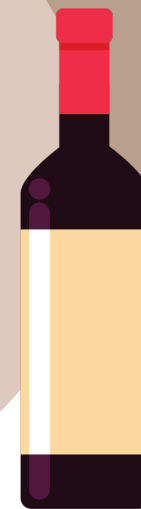
General development of Chenin Blanc and Pinotage varieties and their ageing abilities.

3.

Further improvement in wine quality.

4.

Future prospects: Determine oxygen permeation needed for a specific wine and ultimately choosing a closure according to a specific wine type.



Acknowledgements

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- Dr. Marlize Bekker

