



LABORATORY PROVISION TO THE SA WINE INDUSTRY

Marianne McKay, DVO, US

Presentation structure

- Information gathering
- Generalists (labs that do routine analysis, in which areas)
- Specialists (which assays and providers)

Information gathering

- Email sent to SAWLA@googlegroups
- Respondents answered several questions viz:

Do you provide an analytical service for industry?

If so, what does your lab analyse routinely, and turnaround times for results?

Are there special assays that you are able to do by request?

How a person would go about getting samples analysed by you?

- Conversations
- Email exchanges with laboratories and individuals
- Websearches

A. GENERALISTS

- **Generally: pH, TA, Alcohol, RS, VA, pH, SO₂, protein and tartrate stability, filterability, malic- and lactic acid, CO₂, Brix, micro activity.**
- **Also stability tests (tartrate, protein and colour), colour density at 420 and 520 nm**
- **Most laboratories do these, fast turnaround times (from 3/4 hour to a day in most cases)**
- **Also some very specialised provision by the generalists!**

Routine analyses:

WINE:

- Alcohol Extract SG Rs (Fehling) VA (Distillation) pH TA (Titration) VSO₂ & TSO₂ (Ripper , Asp) Protein stability, Cold stability, Quick Freeze, Freeze test, Bentonite fining, CO₂, Pinking, Colour 520& 420, Drop out, Filterability Turbidity Malic acid Lactic acid MLF DO 280 Glucose/Fructose

JUICE:

- ° Balling pH TA VSO₂ & TSO₂ (Ripper Asp) Glucose
- Fructose Malic Acid Tartaric Acid YAN (NOPA & NH₄)
- NOPA (aminoacids) NH₄ Turbidity Drop out Copper Potassium Polyphenols (F-C)

Also:


Microox analyses, phenolic panels, filtration panels (to see how "safe" you can bottle without filtration), smoke taint analyses, sulphur compounds and much more

WINE:

- Metals Cu, Fe, Ca, K Sterility Micro ID
- RED WINE PHENOLICS, RED WINE FILTRATION DECISION
- SLOW OR STUCK FERMENTATION, STUCK MLF, BRETT MANAGEMENT
- ISO 17025 accredited



- DETECT AND CONTROL TAIN-TRELATED FAULTS
- OPTIMISE POSITIVE AROMA CONTRIBUTORS

ANALYSIS	WHY ?	THRESHOLDS AND AROMAS
TCA and related compounds 2,4,6-TCA*; 2,3,4,6-TeCA; PCA; 2,4,6-TBA (the haloanisoles) <div style="float: right; text-align: right;"> <small>Accredited method</small>  <small>Testing Laboratory</small> <small>10000</small> </div>	<ul style="list-style-type: none"> • Ensure optimal cork quality before bottling • Monitor wine quality before and/or after bottling 	Sensory thresholds Red or white wine: 2,4,6-TCA: 2 - 5 ng/l – moldy-corky 2,3,4,6-TeCA: 10 - 15 ng/l – musty 2,4,6 TBA : 3 - 4 ng/l Sparkling wine: 2,4,6-TCA: 1,5 ng/l 2,3,4,6-TeCA: 4 ng/l 2,4,6 TBA : 1 ng/l
TCA and PCP and related compounds 2,4,6-TCA*; 2,3,4,6-TeCA; PCA; 2,4,6-TBA; 2,4,6-TCP; 2,3,4,6-TeCP; PCP; 2,4,6-TBP (the haloanisoles, halophenols and lindane)	<ul style="list-style-type: none"> • Monitor and prevent contamination of wine resulting from treated wood in the cellar • Air traps, wood samples (e.g. from beams, doors, palletes), processing aids (e.g. bentonite) and bottling materials (e.g. corks) may all be used for testing 	Haloanisoles as above Halophenols and Lindane are odorless but are considered a health hazard
4-EP & 4-EG 4-ethyl phenol; 4-ethyl guaiacol	<ul style="list-style-type: none"> • Monitor and control Brettanomyces-associated off-flavours in wine 	4-EP sensory threshold : 0,625mg/l – medicinal, elastoplast 4-EG sensory threshold: 0,152mg/l – spicy, smokey
METHOXY-PYRAZINES Isobutyl methoxy pyrazine (IBMP); Isopropyl methoxy pyrazine (IPMP)	In Sauvignon Blanc : <ul style="list-style-type: none"> • Monitor levels in vineyard • Optimize skin contact time before pressing In red wines: <ul style="list-style-type: none"> • May be considered a fault (underripe grapes) 	IBMP sensory threshold: 6 ng/l in Sauvignon Blanc; 10 - 15 ng/l in red wine - green pepper, vegetal, herbaceous
GEOSMIN	Monitor and prevent wine contamination via the cellar environment resulting from: <ul style="list-style-type: none"> • Moulds on grapes, e.g. Botrytis cinerea, Penicillium expansum • Bacterial growth in cellar water, e.g. cyanobacteria, actinomyces 	Sensory threshold: 40 - 50 ng/l in white wine and 50 - 80 ng/l in red wine - earthy, bee
ETHYL ACETATE	<ul style="list-style-type: none"> • Monitor and prevent wine spoilage from aerobic yeasts and bacteria 	Rejection level at 160mg/l - acetone character
ACETALDEHYDE (also known as methanal)	<ul style="list-style-type: none"> • Monitor oxidation levels in wine 	Usual content in wine up to 75 mg/l. Above 100mg/L = overripe or bruised apple
GLYCOLS Primarily mono-propyleneglycol	<ul style="list-style-type: none"> • Wine contamination from cooling systems (e.g. leaking tanks, during sparkling wine disgorging etc) 	Legal limit 150mg/l in still and 300mg/l in sparkling wines (OIV)
VINYL PHENOLS 4-vinyl phenol; 4-vinyl guaiacol	<ul style="list-style-type: none"> • Monitor and control white wine fermentation faults 	4-vinyl phenol sensory threshold: 0,440 mg/l - medicinal, "band-aid" 4 -vinyl guaiacol sensory threshold: 0,750 mg/l - spicy
OAK AROMAS Vanillin; guaiacol; 4-methyl guaiacol; 5-methyl furfural; maltol	<ul style="list-style-type: none"> • Monitor and control intensity and complexity of oak aromas during the winemaking process • Compare different oak regimes • Compare different oak products 	vanilla, smokey, caramel, toasted
METHANOL	<ul style="list-style-type: none"> • Export 	Odorless. Permissible limit 250mg/l in white and 400mg/l in red wines (OIV)
ETHYL CARBAMATE	<ul style="list-style-type: none"> • Export 	Odorless but considered as a mild carcinogen - maximum permissible level 30µg/l in Can
OCHRATOXIN A	<ul style="list-style-type: none"> • Export 	Odorless but considered nephrotoxic and immunotoxic - maximum permissible level 2µg/l
CARBARYL (pesticide)	<ul style="list-style-type: none"> • Export 	Maximum permissible residue on grapes 50 µg/kg in EU
AROMATIC HYDROCARBONS Toluene; styrene; alkyl benzenes; alkyl naphthalenes	<ul style="list-style-type: none"> • Accidental contamination from equipment leaks, diesel and hydraulic oil spills, etc 	Styrene sensory threshold: 22µg/l - kerosene-like taint.

- Same day results (even for pm pick-ups) usually 4h
- Supply a service to the whole industry - pick-up trips at our cost:
 - Once a day to Robertson and Franschoek
 - Twice a day to Wellington and Paarl
 - Three times a week in Hermanus in Harvest
- www.vinlab.com **tel:** +27 21 882 8866/7
fax: +27 21 882 8868
mobile: +27 82 390 0447
- Sample volumes: 250ml Sample bottles available at the lab.
- VINLAB MANUAL available = "Wine Bible" full of knowledge and a calculator to help with winemaking sums.



Wynland Analytical Laboratory

- Alcohol – Alcolyzer and Pycnometric, Alcohol (label) , SG, Extract, pH, Total titratable acid, Volatile acidity, Malic Acid, Reducing sugar, Invertsugar
- °Balling/Brix, Free Amino Nitrogen, Free and total SO₂ – Ripper; Free and Total SO₂ – Aspiration
- Stability: Protein, Tartrate (indication only), Freeze test (indication only), Colour (red)
- Fridge (Colour & Tartrate), Bentonite fining, Pinking, Haze (turbidity), Drop-Out
- Metals(Ca,Cu,Fe) , Malolactic fermentation
- CO₂, Optical density (colour), Filterability index



WYNLAND



MICROBIAL ANALYSES

- Cell counts for viable yeasts , Microscopic evaluation, Bacterial/Yeast count Wine TMA (with relevant inhibitors), Lactic acid bacteria, Acetic acid bacteria, Oenococci, Brettanomyces, Total microbial activity (TMA)(Sterility) Wine, E coli, Coliforms, Fecal Coliforms, Listeria, Enterobacteriaceae, Enterococci, Staphylococcus aureus, Salmonella, Shigella, Yeasts, Moulds with PDA (Pulp, D/Fruit), Plate count (Pulp, D/Fruit, Water), TAB, Bacillus stearothermophilus, Byssochlamys, Clostridium, B cereus, Vibrio, Pseudomonas aeruginosa, Legionella , Giardia lamblia, Cryptosporidium, Fusarium



WYNLAND



ALSO: % Acetic acid (vinegar)

- Brandy/liquor alcohol, Obscuration (brandy/spirits)
- Preservatives and anti oxidants
- Pectins and Glucans

ELISA tests:

Enzyme-linked immunosorbent assay (Toxins) (minimum 4 tests)

Aflatoxin, Ochratoxin,
Histamin

Allergens (minimum 4 tests)

Soy, Hazelnut, Almond, Milk, Peanut, Gliadin (Glutin), Egg



Wynland Analytical Laboratory

Subcontracted to do the following analysis:

- metals (Cu, Ca, Fe), FANS (Free Amino Nitrogen), Malic Acid
- **We also provide the following: (Prices available on request)**
- Training of analysts, Set up of finings, Verification of thermometers
- Problem solving - process failures, Checking of pH electrodes, Verification of refractometers, Weighing of small amounts of chemicals for finings, Supply of standardised sugar solutions
- Olive oil – Free fatty acid, Peroxide value

Theresa Louw

2 St Crispin Street, P O BOX 422 WELLINGTON 7654

Tel: 021 8734332

Fax: 021 8734773

e-mail: tlouw@wynlandlab.co.za



- Wine routine analyses: Mostly same day (4 hours) except protein and 72 hour cold stability.
- Handle out of the ordinary, as it arises
- “Reasonably user friendly” 😊
- Request account application on arrival or by email or fax, submit samples by courier.
- sample sizes vary but this can generally be resolved easily.
- Routine: Alcohol pH TA, VA, SO₂ (Free + Total) RS, Glucose / Fructose, Extract (Total + Sugar Free) Invert Sugar , Balling Malic & Lactic Acid, Density SG, Filterability Haze / Turbidity Protein & Cold Stability, Colour (420nm + 520nm) Polyphenols Anthocyanins FAN YAN Heavy Metals (Copper + Iron)



LEAF/FRUIT: Ammonia Phosphate K, Ca, Mg, Na, Cu, Zn, Mn, B, Fe, Al, Additional Analyses Total Nitrogen / Kjeldahl Nitrogen Sulphates, As Ba Cd Cr Co F Pb Li Ni Sr Zn Si

SOIL: Extraction Methods Available : Bray 1 , Bray 2, Mehlich, Olsen, Citric Acid ; **Standard Tests :** pH , Resistance, Acidity, Texture , Ca, Mg, K, Na, Phosphates, Trace: Cu Zn Mn



WATER: Alkalinity (CaCO₃) m-Alk, p-Alk, pH
Conductivity, Hardness SDI / Filterability
Suspended Solids, Dissolved Salts , Phosphate
Orthophosphate Total Phosphorous Total N
Kjeldahl N, Nitrate Nitrite Ammonia Sulphates
Colour Turbidity COD, BOD, Diss Organic
Carbon Fats Oils Grease , Elemental Analysis

Neil van Kooten, MD

Tel: 021 872 9692

Fax: 086 660 5956

Email: neilvk@integrallabs.co.za



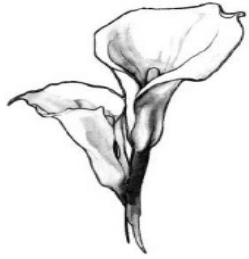
Also: Energy Value Pesticide Residue Analysis,
Microbiological Tests , Drop Out, Pinking Potential
Bentonite & PVPP Fining, Pectin& Glucan , Bottle Fill Height
Internal Bottle Pressure Cork Extraction Test Dissolved
Oxygen, CO2 Glycerol Methanol Gluconic Acid Sorbic
Acid Folin C Index Citric Acid , Tartaric Acid Ascorbic Acid
Ethyl Acetate

Contact **Neil van Kooten, MD**

Tel: 021 872 9692

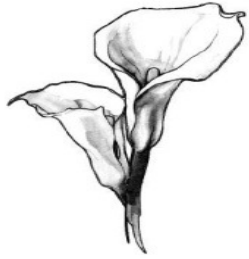
Fax: 086 660 5956

Email: neilvk@integrallabs.co.za



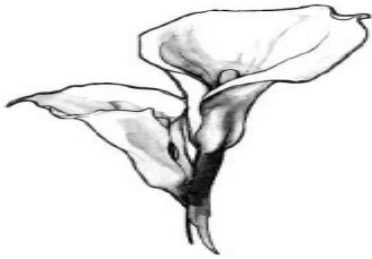
KOELENHOF WYNKELDER

- Analytical services to the wine industry;
- research on phenolic ripeness and yeast projects
- Analyses are done ASAP, results usually with client by end of day.
- special analyses by request
- Request form, leave contact details
- **Liesel Coetzee Posbus 1, Koelenhof, 7605,**
- **tel. 021- 865 2020/1 faks. 021-865 2796**
email: **koelwyn@mweb.co.za**



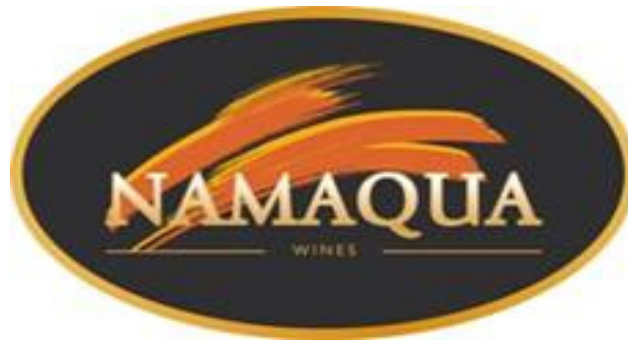
KOELENHOF WYNKELDER

- Alkohol (Piknometer), Spesifieke Graviteit, Ekstrak, Red. Suiker , pH, Totale suur , Wynsteensuur., Appelsuur , vlugtige suur, SO₂ Vry en Totaal – Ripper en Aspirasie, AMG, Proteïenstabiliteit, Bentoniet behoefte, Tartraatstabiliteit – Konduktiwiteit en Vries toets, Pinking, °Balling, Invert Suiker, Sukrose, Glukose / Fruktose, Filtreerbaarheid, Haze / Helderheid, Fermenteerbare stikstof



Koelenhof Wynkelder

- Mikrobiologie - identifikasie, - steriliteit
- Polifenole: Kleur intensiteit 420 nm, Kleur intensiteit 520 nm
- Totale Polifenole - Gallussuur ekwivalente (GAE)- Absorpsie (eenhede/g bessiemassa)
- Totale Tanniene, Antosianien ekwivalente (mg / g bessie massa), Mate van rooi pigment kleuring (%),



- Cellars in the Oliphants River region (Lutzville, Klawer, Trawal etc.)
- 24 Hour turnaround for most routine analyses.
- Contact by phone or mail.

- **Cynthia Magerman**
- **Laboratory Manager**
- **Tel: 027 2131080**
- **Fax: 086 631 2928**
- **Cell: 083 3966 350**
- **E-mail: cynthia@namaquawines.com**



- Analysis for **Swartland region (Piketberg, Porterville, Riebeeck, Malmesbury...)**
- Free & total SO₂; pH & Total acid, VA, Alcohol, Malic acid, Stability tests, Filterability, Red. sugar and MLF/ AMG (paper chromatography)
Analysis time depends, but normally 3/4 hour, if all the above are requested, except stability tests and MLF.
- Results faxed or mailed.

Gerda Eygelaar

- **Tel: 022 482 1134 Faks: 022 482 7114**
- **Swartland Winery Ltd PO Box 95
Malmesbury RSA**

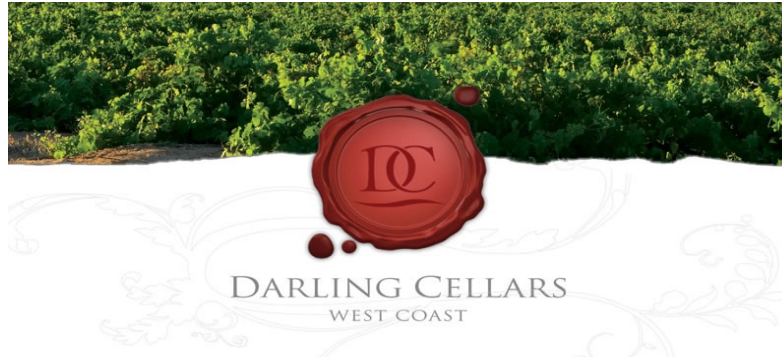


- Lab affiliated to Robertson Coop and Robertson Winery
- Robertson , McGregor , Ashton , Bonnievale en Montagu areas.
- TA , pH, SO₂, Ripper /aspirasie , VA , RS Rebelein, Alcohol pikno , protein en tartrate stab. AMG.
- Pinking , grapescan / winescan during harvest, routine analyses, micro en yeast counts.
- Turnaround time depends on assay.

Johan Moolman

023 626 8822 Lab 023 626 2926 FAX

lab@robertsonwine.co.za

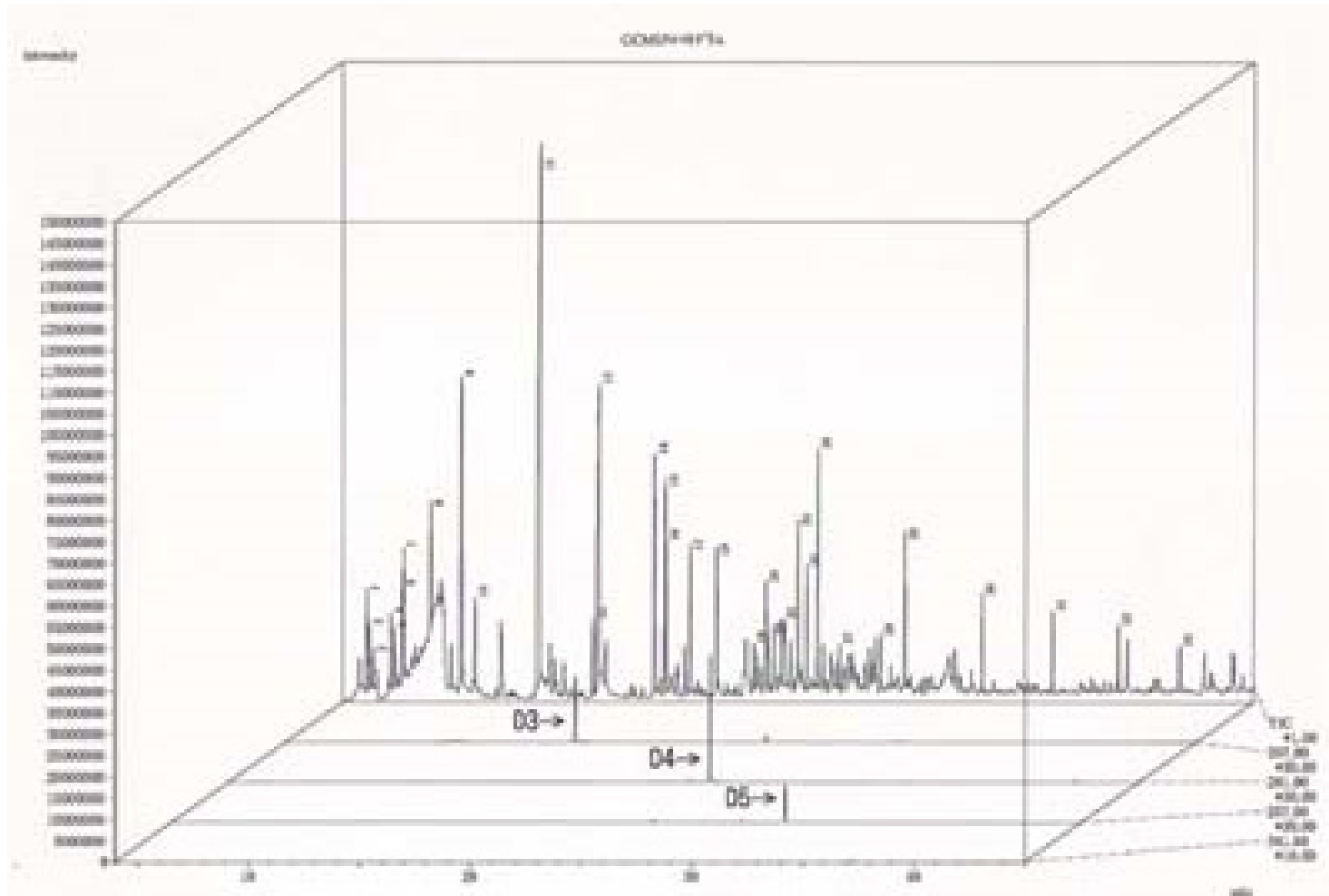


- Cellars and farmers in the **Darling area**.
- Analyses are done same day -results are e-mailed to clients.
- Alcohol, SG, Extract, Brandy /Spirits, pH, TA, VA, Reducing Sugars, Balling/Brix, Free & Total SO₂, Protein Stability, Tartrate Stability, Bentonite Fining, Pinking, Micro, CO₂, NTU, Filterability, AMG, volume between 50ml- 1.5L depending on analysis
- For specific tests , samples taken to Wynland, VINLAB, etc.

CONTACT: Esmaré Hugo

- **LABORATORY- DARLING CELLARS** www.darlingcellars.co.za
Tel: 022 - 492 2276
Fax: 022 - 492 2647

B. SPECIALISTS





- We provide the analysis of dissolved oxygen and headspace oxygen on site.
- This includes the measurement of:
- Dissolved oxygen (DO) in tanks and barrels, DO in bottled wine (non-invasively), Headspace Oxygen (HO) in tanks, barrels and bottles (non-invasively)
- Testing the efficacy of inert gasses (CO₂, N₂) used for protection of half full tanks, barrels etc.



- Troubleshooting bottling process for O pickup, testing cellar equipment and processes for O pickup: Pumps, presses, filters (candle, crossflow, sheet) filler bowl, filler heads, cold stabilisation, etc, validating microx
- On special request tannin analyses of young wines or wines ageing in tanks or barrels,
- Contact
- **CORK SUPPLY SA** (Hanneli van der Merwe)
Technical Manager
Tel: +27 21 886 4830
Fax: +27 21 886 4834
Cell: 083 628 6993
- Email: hanneli@corksupply.co.za
Website: www.corksupply.com





agriculture,
forestry & fisheries

Department:
Agriculture, Forestry and Fisheries
REPUBLIC OF SOUTH AFRICA

- **Residue Analysis**
- in compliance with SA international agreements includes pesticide residues from registered spraying programmes
- Listed in the requirements of importing countries, as well as banned / illegal substances.
- [Standard operating procedure](#) on sampling for **agro-chemical residue levels, as well as [Standard operating procedure](#) on sampling for **mycotoxin levels** available**



agriculture,
forestry & fisheries

Department:
Agriculture, Forestry and Fisheries
REPUBLIC OF SOUTH AFRICA

- Department of Agriculture (Export purposes)
- **Flip Alberts: (021 809 1673)** additives, legal and illegal (mp's ethyl carbamate, Pb, MeOH, artificial sweeteners and colours)
- Ochratoxin A , if EU requirement
- spray residues (50 -60 of them) – does not happen unless you are exporting- DAFF not allowed to compete with private labs
- wine has to be export country requirement EU specifically, but all countries have different reqs
- **Jannie Goosen 021-809 1674**

Roediger Agencies cc

- Andy Roediger, Polymer Science, University of Stellenbosch
- Glories method for phenolic ripeness and advice
- Tel Number: (021) 808 3175
- Fax Number: (021) 886 4731
- email: ahar@sun.ac.za



Thales/ Quantum



The laboratory is responsible to the SA Cork Council

Analytes tested for at Quantum

2,4,6-TCA, 2,4,6-TCP; 2,3,4,6-TeCA; 2,3,4,6-TeCP 2,4,6-TBA,
2,4,6-TBP , PCA, and PCP

**3 days TCA in wine and water and 7days for anisoles and phenols in
Air, Wood)**

**Brett analysis and Audits can be done through Thales who prefer to
handle the sampling because we work with “ng/L”**

QUANTUM: CONTACT: Lindane

- **Physical Address:** JH Neethling building, Victoria street,
Stellenbosch, Institute for Wine Biotechnology, U.S

www.quantumwinelab.co.za

Tel: +27 (0) 21 887 1235

Fax: +27 (0) 21 887 1248

HAVE YOU BEEN TESTED?

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Quantum
LABORATORIES

**TCA TAINT &
TBA TESTING**

TEST YOUR WATER & WINE

Trace Analysis for Wine and Cork



Wine



Cork



Water



Air



Wood



Other

- TCA Cellar Audits
- Recommendations
- Sampling
- Laboratory Analysis

Thales STELLENBOSCH

TEL: +27 (21) 887 1232/5 FAX: +27 (21) 887 1248 email: thales@thaleswcs.co.za

visit www.quantumwinelab.co.za

CELLAR HYGIENE • CORKTAINT • ORGANOHALOGENS • TCA • TeCA • PCA • TBA



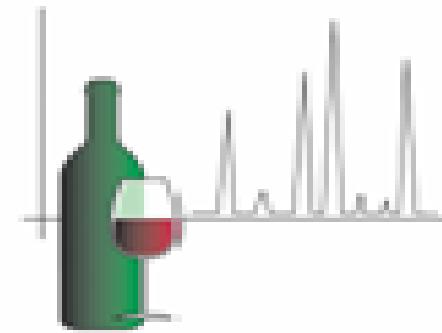
CAF | CENTRAL ANALYTICAL FACILITY

- Natamycin and ochratoxin A analysis routinely.
- Turnaround for natamycin is 3 days. Ochratoxin is slower, batched
- Biogenic amines, resveratrol and amino acid analysis on request and by appointment.

Dr. Marietjie Stander
MS Unit, Central Analytical Facility
Room 255, JC Smuts building
Private Bag X1, Matieland 7602
Stellenbosch University

Tel: 021 808 5825 Fax: 021 808 5863

www.sun.ac.za/saf



- We will do specialised analysis , depending on instrument time
- phenolic compounds, sugars, organic acids, glutathione, resveratrol, major volatile aroma compounds , monoterpenes, volatile phenols, diacetyl, acetoin and 2,3 pentanedione.
- Contact Helene Nieuwoudt (hhn@sun.ac.za)
- or Andreas Tredoux (atredoux@sun.ac.za)
- Fill in a ‘request for analysis’ form available from us

Sensory Science Facility at SU



- Descriptive and discrimination testing using trained panels, for a wide range of food products and beverages
- Consumer testing, i.e. recruiting target consumers and testing for preferences using appropriate tests
- Statistical analyses at the ARC Biometry Unit, Infruitec,
- **Contact details** Nina Muller - Department of Food Science, Stellenbosch University E-mail: mm7@sun.ac.za
Tel: 021 808 3398 or 021 808 3578

Information

- SAWLA LINKS TO MEMBER WEBSITES

<http://www.sawla.org/memberlinks>

DEPT AGRIC FORESTRY AND FISHERIES:

<http://www.daff.gov.za/>

GRATEFUL thanks to:

- Kiffie de Wet (Elsenburg) 021-8085480 😊
- Theresa Louw (Wynland)

