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FINAL REPORT 2020

Winetech Number : UCT JS 17-01

1. PROGRAMME & PROJECT LEADER INFORMATION

	Research Organisation leader	Project leader
Title, initials, surname	Mr J Steyn & A/ Prof David Priilaid	Mr Jonathan Steyn
Present position	Convenor Wine Business, Hospitality Leadership & final year PhD candidate UCT GSB/ Head Section for Applied Management, School of Management Studies, UCT	Convenor Wine Business, Hospitality Leadership, Elsenburg B.Agric Cellar Management, & final year PhD candidate.
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2. PROJECT INFORMATION

Project title	Unlocking market value in SA old vines resources: perspectives on the challenge in exchange, competition and production
Short title	Unlocking market value in South Africa's old vine resources

Fruit kind(s)	Wine		
Start date (mm/yyyy)	2017-07	End date (mm/yyyy)	2020-04

Key words	Old vines category; market value; South Africa
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	CFPA	DFTS	HORTGRO	SATI	WINETECH	ARC	OTHER
TOTALS All years	R 0	R 0	R 0	R 0	R 250875	R 0	R 0

Total cost of entire project	R 250875
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3. EXECUTIVE SUMMARY

Objectives and Rationale

Nascent categories like SA old vine wines (OV) raise the question of whether, to what extent, how and why value can be unlocked? We model producer price efficacy, consumer choice preferences and potential drivers behind such choices, ultimately informing purchase likelihood for such categories of wine.

Methods

1. OLS hedonic pricing model computed play of cue-variables for SA old vine wines.
2. PLS-SEM modelled significance and strength of relationship between consumer tendencies, resonance, quest and purchase probability for OV wines.
3. Explicit direct and indirect (stated and discrete conjoint), and implicit (neuro-psychological) effects on OV attribute choice.

Key Results

1. SA producers add a significant premium to OV wines according to vineyard age.
2. Consumers are more likely to buy OV wines when resonant (e.g. OV are quality), intensified by the mediation of quest (e.g. familiarity) and conforming to buying tendencies (e.g. scarcity).
3. Subconscious and explicit responses to OV cues are generally positive and correspond.

Key Conclusion of Discussion

Findings validate the worth of SA OV wines from a producer and consumer perspective.

Take Home message for Industry

These studies demonstrate that OV attributes are markers of quality, status and value. Worthy exploring longitudinal (over time), parent brand (SA country brand), upstream (production market) and global value chain effects.

4. PROBLEM IDENTIFICATION AND MOTIVATION

Problem Identification

The question of whether, how and why any value in South Africa's 3505 ha of old vines (OV) can be unlocked has dominated recent viticultural, winemaking and wine marketing conversations in South Africa and globally. This at a time when an apparent disparity exists between a recent quality leap and the South African wine category's market status and aggregate value. Three recent developments amplify such conversations. Firstly, the proliferation of OV bottle extrinsic-cues amongst South African wines since the late 1990's. Secondly, in 2016, the Old Vines Project (OVP) business association was established to protect, standardise and unlock market value in the South Africa's OV resource base. Thirdly, a Certified Heritage Vineyard seal was introduced in 2018 to restrict uncontrolled vineyard-age related label claims. Arguably, the OV category is being mooted as a means by which country brand perceptions, status and value can be elevated. Yet, scholarly investigation into the

value-contribution of OV's across several natural and social science disciplines is relatively sparse and inconclusive.

Motivation

O1. To evaluate the worth that producers placed on nascent OV cues on South African wine labels relative to more established cues such as aggregate ratings, origin, vintage, brand and variety. This study will explore if producers have confidence in vineyard age cues as a way of adding premium to their wines.

O2. Investigated the consumer market value of OV category wines, by explaining predictors such as psychological tendencies (independent variable) and purchase probability (dependent variable) of consumer resonance (mediating variable) with SA OV category wines. If vineyard age cues resonate with consumers it will assist industry in improving the growth of the old vine category. Similarly, it will behaviorally segment consumers according to inherent psychographic traits.

O3. Investigated actual consumer choice in a controlled experiment. This experiment assessed whether, to what extent and on what level (subconscious / explicit) wine consumers' place importance on OV cues compared to competing cues such as grape variety and area-of-origin at a given price point. This will inform industry as to what the optimal profile of old vine wine is, indicate the market share of old vine attributes and inform on what attributes perform consumer choice for old vine wines.

5. ACCUMULATED PROGRESS TABLE

Objectives	Milestones (Significant event or stage in a project)	Date Achieved
O1. Estimating the value of nascent old vine cues	M1.1 Write up of findings and submission of paper for peer review. M1.2 Acceptance to conference and preparation of paper for publication in accredited international journal M1.3. Communication of preliminary results to industry M1.4. Submission of paper to international peer reviewed journal. M1.5. Revise and resubmit for journal publication. M1.6. Release of final research results and executive summary.	2019-09-30
O2. Explaining predictors and purchase performance of consumer resonance: the case of old vine category wines in South Africa	M2.1. Research proposal generated M2.2. Survey instrument constructed. M2.2. Ethical clearance obtained. M3.3. Expert survey (n=25)	2020-12-31

	M3.4. Scale purification M2.5. Exploratory data collection (n=35) M2.6 EFA and scale purification. M2.7. Confirmatory data collection (n=50) M2.8. CFA for reliability, PLS-SEM for construct validity and finalisation of survey. M2.9. Online survey data collection (n=500) (delayed due to COVID-19, but exploratory data available). M2.11. PLS-SEM analysis (delayed due to COVID-19). M2.12. Write up of paper (s) and executive summary (delayed due to COVID-19). M2.13. Submission of paper for peer reviewed journal (delayed due to COVID-19).	
Q3.The relative demand-side importance of South African old vine wine cues	M3.1. Generate research proposals and protocol. M3.2. Generation of choice-based profiles and experimental set up. M3.2. Ethical clearance M3.3. Testing of neuro-physiological equipment. M3.4. Refinement of research protocol. M3.5. Data collection/ experiment M3.6. Data analysis/ experiment (delayed due to COVID-19, but preliminary data analysis available) M3.7. Paper (s) write up (delayed due to COVID-19). M3.8. Submission to peer reviewed journals/conferences (delayed due to COVID-19)	2020-12-30

6. WORKPLAN (MATERIALS AND METHODS)

O1 - Backend access to Wine-Searcher platform enabled us to collect pricing and ratings data. This was augmented by access to Jancis Robinson website, as well as Wine Spectator. This was supported by digital images of wine labels collected from various outlets. Producers were contacted where further information was required. Data was analysed using SPSS.

O2 - Survey was constructed on UCT Commerce Qualtrics Software. XISTAT used to generate Cronbach Alpha's to assess construct validity. SMART-PLS and SPSS used to construct formative partial least squares structural equation model.

O3 - Images generated using Canva software. Neuro-physiological (N-P) lab equipment (US)

including EEG (electroencephalography) EMG (electromyography) GSR (Galvanic Skin Response) and eye tracker to measure subconscious response. Images loaded onto UCT Commerce Qualtrics Software and Sawtooth DCM software to measure direct and indirect explicit response. XLStat analysed direct (ranking responses) and Sawtooth backend analysed discrete responses. NeurOhme Poland analysed Neuroscience data.

7. RESULTS AND DISCUSSIONS

O 1 - Estimating the value of nascent old vine cues

Vine age has a significant impact on wine price and SA producers clearly see value in the old vine cue. As per **Table 1**, 159 wines were sampled from the 290 found on the market (only those with a rating on Wine-Searcher were selected for inclusion). Average price point was R310, while the upper and lower bands were R750 and R153 respectively. One can clearly see that vine age ratings and price are correlated. In terms of table 2, one can see that quality ratings have the most significant influence on the price of OV wines, attracting a premium of R65,62 per 1-point increase on Wine-Searcher's 100-point rating scale. In addition, OV varieties emblematic of South African wine heritage, such as Pinotage, attracted an even greater price premium of R332,51. This in contrast to white blends which had a significant discounting effect of the price of OV wines (-R153.89) Furthermore, areas-of-origin with a reputation for quality, such as Stellenbosch, attracted a price premium of R 58,37. However, the most surprising finding, worthy of future investigation, was that while OV cues on the back label had a premiumising effect (+R85.01) those on the front label had a discounting effect (-R67,84). In fact, for every year a vineyard ages wine price improves by R2.96. In unreported findings, certain brands emblematic of the OV category such as Mullineaux had a significant premiumising effect on wine price (+R192,35).

Table 1. The distribution of price segment by mean price and mean vine age

	Total	Mean Price	Mean Vine Age	Mean Quality
Super ultra-premium (R501 - R1590)	18	R787	69	91.10
Ultra-premium (R201 - R500)	93	R310	54	90.02
Premium (R101 - R200)	40	R153	43	88.85
Entry-level (R55 - R100)	8	R75	45	88.25
	159			

Table 2. Significant cues, measures and interpretation

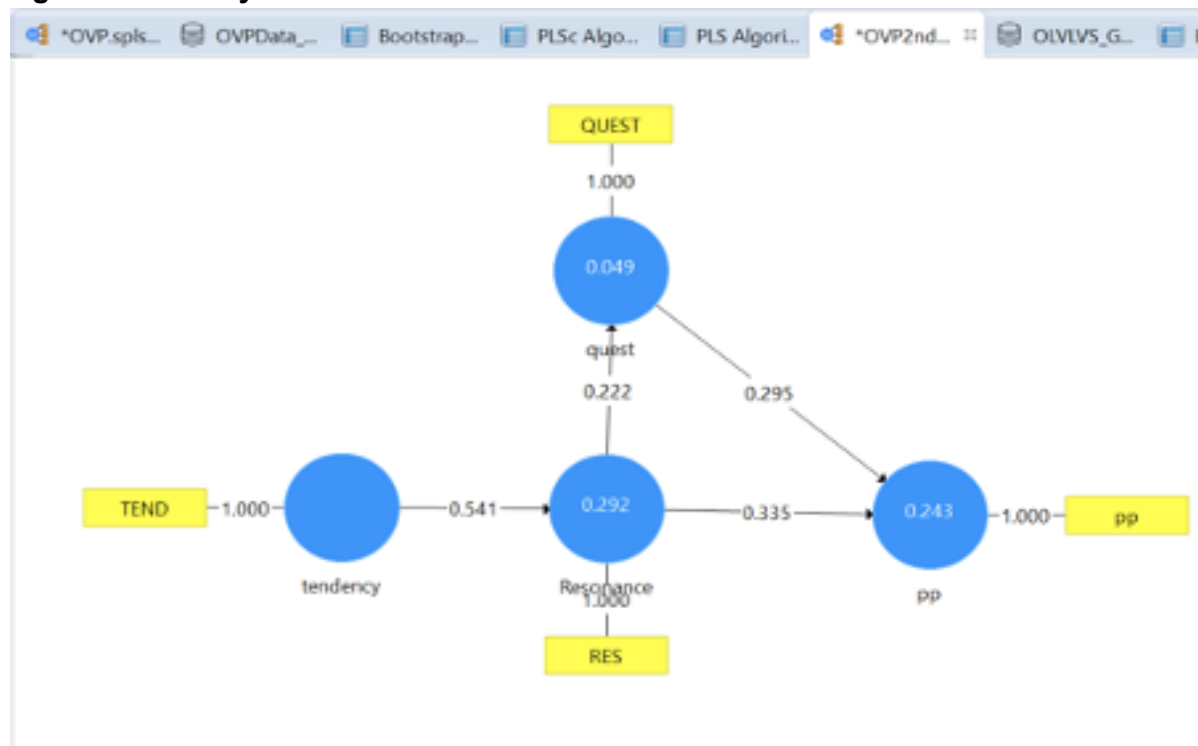
Attribute	Measure	Coeff	p-value	Interpretation
H1: Quality Ratings	Wine-Searcher ratings.	R65.62	0.00	For every 1-point increase on Wine-Searcher 100-point ratings scale price increases by R65.62.
H2: Vineyard Age	Age or approximate age of vineyard.	R2.96	0.00	For every year of additional age of vineyard, price of wine increases by R2.96.
H3: Grape Variety	Pinotage	R332.51	0.00	Premium of R332.51 on Pinotage cue.
	White Blend	-R153.89	0.01	R153.89 discount on white blend cue or absence of cultivar designation.
H4: Cue Location	OV mentions on front label.	-R85.01	0.02	Discount of R85.01 on worth of OV cue on front label.
	OV mentions on back label.	R67.84	0.05	Premium of R67.84 placed on worth of OV cue on back label.
H5: Origin	Stellenbosch	R58.37	0.11	Premium of R58.37 on Stellenbosch district of origin.

O2 - Explaining predictors and purchase performance of consumer resonance: the case of old vine category wines in South Africa

Partial least squares structural equation modelling (PLS-SEM) is particularly valuable for exploratory research purposes and for “whether”, “how” and “why” research questions by estimating the strength of relationships between several constructs. A number of tested scales derived from extant literature were used as the starting point to construct the hypothetical model. Utilising Churchill's (1979) scale purification protocol, we collected data in two tranches from experts and highly involved buyers/consumers and performed an exploratory factor (EFA) and confirmatory factor analysis (CFA) on the data. Three clear first order constructs emerged: *proneness* (independent variable) (Cronbach's alpha: 0.89), *resonance* (mediating variable) (Cronbach's alpha: 0.89) and *purchase probability* (dependent variable) (comprised of 12 point Juster scale). However, after running the data through PLS-SEM analysis to determine

Table 3. Path bootstrapping

Path	t values	p values
QUEST -> FAM	8,591	0
QUEST -> INV	6,554	0
QUEST -> PERF	5,527	0
QUEST -> pp	2,633	0,009
RES -> CONN	21,336	0
RES -> QUAL	53,753	0
RES -> QUEST	2,01	0,045
RES -> RARE	20,916	0
RES -> TRAN	18,223	0
RES -> pp	2,581	0,01
TEND -> RES	6,253	0
TEND -> SCAR	46,224	0
TEND -> UNIQ	132,419	0

Figure 2. Pathway coefficients on first order constructs**O3 - The relative demand-side importance of South African old vine wine cues**

Conjoint models are a particular class of econometric models used to explain and predict choices among a finite set of alternatives (in this case product categories and attributes encapsulated in product profiles). They are conscious or explicit choice -based models because respondents are cognitive about the choices they have made. Two variants were used here. Firstly, *stated choice* is a direct method of choice where respondents rank a a sample of statistically selected product profiles. Secondly, in *discrete choice* models (DCM) respondents choice between all possible alternatives. Therefore, if 5 categories with as many as 4 different attributes are selected to profile the products to be presented to respondents, as in **Table 4.**, the

amount of possibilities will be $2 \times 4 \times 2 \times 3 \times 2 = 96$ possible profiles. In the case of stated choice *ranking* a sample of 10 optimised profiles, as seen in **Table 7**, were generated and presented to respondents (n=93) to be ranked, while with DCM all 96 profiles were created and respondents were presented with 3 options at a time and could choose one or none of them. When analysed we were able to establish: 1) **the importance of each category** (eg. Certified Heritage Seal) and utilities of each individual attribute (eg. seal / no seal) that made up 100% of the consumer choice. Utilities / importances are scores that measure how each attribute / category influences the consumers decision to choose a product. 2) **Share of preference / market share simulation** simulates the share that each profile will occupy in the hypothetical market.

Implicit or subconscious choice is far more complex since the respondent is not cognitive and tends to vary across different measures. Such measures are: 1) EEG (electroencephalography) which uses electro-chemical signals in the frontal cortex to determine personal relevance and predict choice; 2) EMG (electromyography) which uses facial muscle responses to predict decision making; 3) GSR (Galvanic Skin Response) which measures sweat response and therefore emotional arousal; 4) and eye tracker technology which monitors visual attention to determine areas of interest (AOI).

In general there was congruence between implicit, explicit direct (ranking) and explicit discrete (choice based conjoint) concerning the most preferred profile (profile 4: Seal, old vine mentioned on back label, W.O Stellenbosch, R155). This also corresponds broadly with the objective 1 findings. In **Figure 4** you will note that profile 4 occupied 25% of the market in direct choice and 28% of the market with discrete choice. As far as importances are concerned, old vine attributes (seal and OV mention) accounted for 25,41% of the purchase decision with direct choice and 21,41% with DCM. In terms of subconscious choice, notable significance on profile 4 was the EEG ($p=0.054$; $t=1,957$) and GSR ($p=0.00$; $t=3,298$). The eye-tracker hotspots indicated in **Figure 5**. seem to correspond with the importances in the explicit response. Once again, owing to the advent of COVID-19 a deeper analysis of subconscious choice could not be completed.

Table 4. Categories and attributes

Source	Nbr. of Attributes	Attribute 1	Attribute 2	Attribute 3	Attribute 4
Heritage Seal	2	No seal	Seal		
Old Vine	4	Both	Front	Back	None
Mention					
Cultivar	2	Chenin	Pinotage		
Region	3	Stellenbosch	Swartland	Western Cape	
Price	2	155	310		

Table 5. Importances of categories

Source	Direct (ranking)		Discrete (choice-based conjoint)	
	Mean	Std. deviation	Mean	Std. deviation
Heritage Seal	9,930	8,493	9,77567	9,69627
Old Vine	15,491	10,041	11,63406	8,01437
Mention				
Cultivar	14,774	13,366	11,36833	8,92883
Region	26,076	15,781	31,02332	16,84057

Price	33,730	14,759	36,19863	15,34934
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Table 7. Optimised sample of wine profiles

Product ID	Old Vine	Position	Region	Variety	Price
Product 1	No seal	Both	Stellenbosch	Chenin	155
Product 2	No seal	Front	Swartland	Pinotage	155
Product 3	Seal	Front	Western Cape	Pinotage	155
Product 4	Seal	Back	Stellenbosch	Pinotage	155
Product 5	No seal	Back	Swartland	Chenin	310
Product 6	Seal	Front	Stellenbosch	Chenin	310
Product 7	Seal	Both	Swartland	Pinotage	310
Product 8	No seal	None	Stellenbosch	Pinotage	310
Product 9	No seal	None	Stellenbosch	Pinotage	310
Product 10	Seal	None	Swartland	Chenin	155

Figure 3. Most preferred profile (profile 4)



Figure 4. Share of preference / market share for profiles 1-10

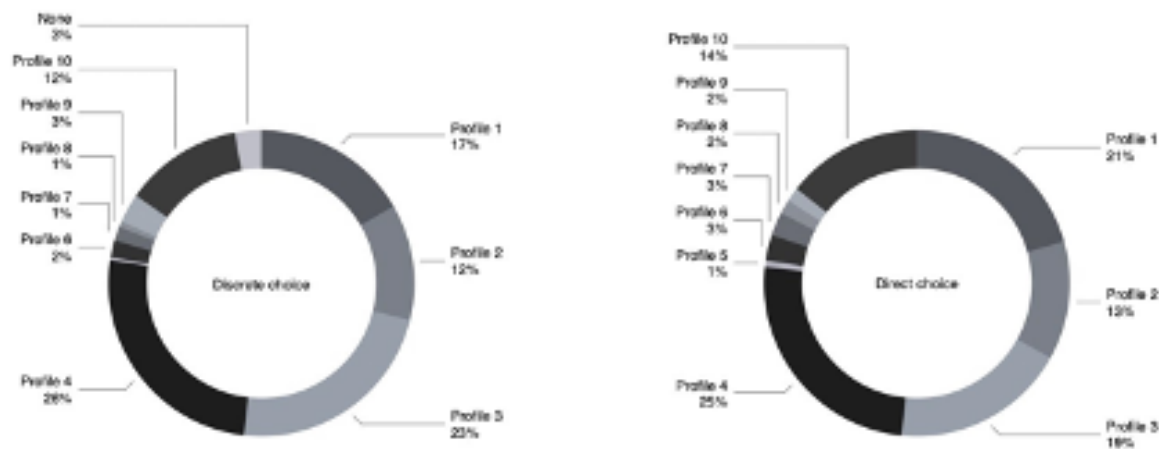


Figure 5. Eye-tracking heat map of profile 4



8. CONCLUSIONS AND RECOMMENDATIONS

Firstly, a vineyard's age appears to provide a significant means by which producers price OV wines, adding a premium of R2.96 to a bottle of wine for every year a vine remains in the ground. Secondly, there is formative indication that certain psychological antecedents (e.g. proneness to scarcity and uniqueness) seem to positively influence resonance (eg. transcendent and rarity value) with old vine wine attributes which in turn positively influence consumers seeking out such wines (eg. becoming more involved), ultimately increasing likelihood to purchase (eg. certainty of purchase) SA wines in this category. Thirdly, old vine attributes seem to be a significant means by which consumers choose wines on a conscious and subconscious level.

Clearly, there is much value both from the supply and demand side that can be created through the signalling of old vine attributes on SA wine labels. This positive result seems to indicate that further value can be created further upstream in the primary and secondary production realms of the value chain and delivering improved sustainability for growers, something to be tackled in future research. Furthermore, it this research provides impetus for further research to build a rich picture. Moreover, the relatively significant value and status of the old vine category may serve as a useful exemplar of how a nascent category can premiumise, providing valuable lessons for other categories such as the SA country brand, Chenin Blanc, Pinotage and so forth. Finally, It may be worthwhile expanding the studies to various markets and over time with a larger sample of consumers and OV wines to see if these exploratory results hold.

9. PLANNED OUTPUTS

a) TECHNOLOGY DEVELOPMENT, PRODUCTS AND PATENTS

The findings have strategic value and do not have any direct commercial potential. Pricing model and Implicit vs explicit consumer choice (direct and indirect) modelling methodology have wide application to other categories and product classes.

b) SUGGESTIONS FOR TECHNOLOGY TRANSFER

Insights should be shared with multiple industry stakeholder to assist producers in decision-making on the basis of findings. Executive summaries to be shared in trade publications and via future seminars.

c) HUMAN RESOURCES DEVELOPMENT / TRAINING (STUDENTS)

Student Name and Surname	Student Nationality	Degree (eg Hons, MSc)	Level of studies in final year of project	Total Bursary Cost for Industry for entire project
Honours				
Masters				
PhD				

Postdocs				
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d) LIKELY PUBLICATIONS (POPULAR, PRESS RELEASES, SCIENTIFIC)

Steyn J, & Priilaid, D. 2018. The hedonic pricing of novel attributes: Exploring the relative worth of old vine cues in South African wines. Full paper in conference proceedings at SAIMS conference, Stellenbosch University, Stellenbosch, 2 - 4th September 2018.

Priilaid, D. and Steyn, J. (2019), "Evaluating the worth of nascent old vine cues for South African wines", International Journal of Wine Business Research, Vol. 32 No. 2, pp. 283-300. <https://doi.org/10.1108/IJWBR-04-2019-0029>

Steyn, J., Priilaid, D. and Human, G. (2021), "Explaining the predictors and purchase performance of consumer resonance: the case of old vine category wines in South Africa", TBC

Steyn, J., Priilaid, D. and Boshoff, C. (2021), "The relative demand-side importance of South African old vine wine cues: Implicit and explicit consumer preferences", TBC

e) PRESENTATIONS/PAPERS THAT COULD BE DELIVERED

Multiple presentations have been made to Industry both locally and globally. These include:
AAWE 2017

SASEV conference 2018

SAIMS 2018 (Oxford University Press Best Marketing Track Paper)

Pinotage Association AGM 2019

International Chenin Blanc Conference 2019

Old Vine Project

KWV

Old vine seminars in 2020 :<https://www.youtube.com/watch?v=c2rcmCdFXuA&t=645s> and <https://www.youtube.com/watch?v=6Ho51mwMfGQ&t=465s>

Article on old vines: <https://news.wine.co.za/news.aspx?NEWSID=36163>

10. PROJECT OUTCOME AND IMPACT

New Knowledge	Benefits Chain	Supply	Direct Application	Grower	Direct Packhouse/Winery/Cellar Application	Other
X	X		X		X	X

Other is:

May have application to other categories and product classes

The Value of the project to industry

Suggests protecting potentially valuable economic and cultural resource for future generations, developing industry standards and policy around old vines, consumer choice drivers and potential market share insights, assist in brand extension and new product

development decisions, facilitate premiumising strategies, demographic and behavioural profiling of OV consumers

11. PERSONS PARTICIPATING IN THE PROJECT:

INITIALS AND SURNAME	HIGHEST QUALIFICATION	RACE (M,W)	GENDER (M,F)	INSTITUTE DEPARTM	POSITION	TOTAL COST TO PROJECT
RESEARCH PERSONNEL						R 165633
Prof Christo Boshoff	PhD	W	M	SU	Coll	R 0
Nadia Hefer	MBA	W	F	UCT GSB	RA	R 25500
Raphaela van Embden	BA	W	F	UCT GSB	RA	R 107074
Jonathan Steyn	MSc PhD (pend)	W	M	UCT GSB	PL	R 0
A/ Prof David Priilaid	PhD	W	M	UCT	Co	R 0
Hanneke Botha	MSc				RA	R 33059
Prof Gert Human	PhD	W	M	SU	Coll	R 0
SUPPORT PERSONNEL						R 0

POSITION: Co = Co-worker (other researcher at your institution)

Coll = Collaborator (participating researcher that does not receive funding for this project from industry)

PF = Post-doctoral fellow

PL = Project leader

RA = Research assistant

TA = Technical assistant/ technician

12. TOTAL COST OF PROJECT

TOTAL ANNUAL COSTS (ALL YEARS)	CFPA	Raisin SA	HORTGRO	SATI	WINETECH	ARC	OTHER	TOTAL
2015	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
2016	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
2017	R 0	R 0	R 0	R 0	R 22613	R 0	R 0	R 22613
2018	R 0	R 0	R 0	R 0	R 139050	R 0	R 0	R 139050
2019	R 0	R 0	R 0	R 0	R 89212	R 0	R 0	R 89212
2020	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
TOTAL	R 0	R 0	R 0	R 0	R 250875	R 0	R 0	R 250875

