



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

An appraisal of uncertainties in the Western Australian wine industry supply chain¹

Nazrul Islam

Department of Agriculture WA
3 Baron-Hay Court, South Perth WA 6151
Phone: 6-1-9368-3803
Fax: 6-1-9367-4265
E-mail: nislam@agric.wa.gov.au

Mohammad Quaddus
Graduate School of Business
Curtin University of Technology
78 Murray Street, Perth, WA 6000
E-mail: Quaddusm@gsb.curtin.edu.au

Abstract

Wine is one of the significant export items of Western Australia. In 2001/2002, the State's wine exports amounted to about A\$42 million. Despite its economic importance research on the supply chain aspects of WA wine industry is rather limited. This paper presents the sources of uncertainties in WA wine supply chain based on the results of an electronic focus group study with WA wine industry stakeholders. The group identified 74 items of uncertainties, which were then grouped into 26 unique major headings. It was revealed that sources of most of the uncertainties are operational with 'storage/transport/logistics' topping the list.

key words: uncertainty, supply chain and wine industry.

¹ A contributed paper for the 49th Annual Conference of the Australian Agricultural and Resource Economics Society 9-11 February 2005, Coffs Harbour, NSW, Australia.

INTRODUCTION

There has been exponential growth in the Australian wine industry in the last decade (AWBC 2004a). Both domestic and export markets performed extremely well contributing significantly to the Australian economy by way of generating revenue from exports as well as generating and encouraging local business (Thomas and Islam 2003). Exports of Australian wine significantly increased from 24% in 1992-93 to 56% in 2002-03, thus outperforming domestic sales and generating \$A2.43 billion as of January 2004 (AWBC 2004b). In 2001 Australia was the 6th largest producer of wine in the world (behind France, Italy, Spain, USA and Argentina) and it accounted for 3.9% of total world production (AWBC 2004c). It was 4th largest in terms of world export market share capturing 5.2% of the market in terms of volume and 6.4% of the market in terms of value (AWBC 2004c).

Wine is even more important for Western Australia. It produces about 3.5% of nation's wine, which is about 0.2% of the world's wine production. In 2002 WA's wine exports and interstate sales amounted to about A\$31 million and A\$85 million respectively, making it one of the significant agricultural products of the state (Tywoniak 2004, Thomas and Islam 2003).

However, behind the rosy picture of wine in Australia and WA there are significant problems. Major problems lie in the impacts of production cycles, complexity of highly differentiated product and the risk of seasonal variability (Stanford 2002). Net plantings of wine grape peaked in 1998-99 but have fallen significantly in 2001-02 due to a number of factors including supply abundance of wine over the last decade. Noting that there is a chain of independent business entities between planting and selling wines (the wine supply chain), this net fall in plantings will certainly constrain the future sale of wine (Stanford 2002). It is estimated that time lag between planting and selling wine is between 3 to 5 years (Stanford 2002). Stanford (2002) mentions that production cycles in Australian wine industry are a regular feature. "The Australian wine industry has a 200 year history of cyclical booms and busts" (AWBC 2004a). The trick is to manage this dynamics effectively. In the literature it is widely known as "supply chain dynamics" (Swaminathan *et al.* 1998).

Like any other product, oversupply volumes of wine are stocked at the wine producers or distributors level. Increased international demand and/or price adjustments by the wine producers eventually clear the oversupply. But there is always a time lag which contributes towards behavioural rational and/or irrational decision making thus creating further instability in the wine supply chain. Stanford (2002) mentions that stock-to-sales ratio (SSR) of Australian red wine had risen to an unacceptable level of 3.0 in June 2001, thus indicating huge stock of red wines. However, SSR of white wine was about 1.28 in 2001-02. The author also observed that there had been significant booms and busts of SSR over the period of 1984-85 to 2001-02.

The obvious question is what are the key determinants of these booms and busts in Australian wine production and SSR? What are the uncertainties that create this cycle? How the supply chain dynamics can be modelled to understand the impacts

of these determinants? What are the key decision variables which will smooth the booms and busts? These issues need to be addressed to sustain (and perform even better) the phenomenal growth of the Australian wine industry.

This paper makes an attempt to understand the sources of uncertainties in the context of WA wine industry supply chain. This is the first stage of a larger project which looks into developing a model based Decision Support System (DSS) to study the supply chain dynamics of WA wine industry. In the next several sections we present relevant background literature, research method and design, results and conclusions.

BACKGROUND LITERATURE

Researchers and practitioners have defined supply chain in a number of related ways (for example see Lee *et al.* 2002, Landeghem and Vanmaele 2002, and Ovelle and Marquez 2003; among many others). One common aspect of any supply chain, however, is the flow of products from its source (grape growers, wineries, wholesalers etc.) to its destination (retail stores, customers etc.). For example, figure 1 presents the supply chain of WA wine industry identified by Thomas and Islam (2003) which shows the flow of products (wine grapes, wine etc.) from the supply to the demand side and the flow of information (market signals) from the demand to the supply side. Landeghem and Vanmaele (2002) identify three hierarchical levels of supply chain: operational, tactical and strategic. This paper deals with strategic supply chain dynamics of WA wine industry. To this end we adopt the operational definition of supply chain as “a network of autonomous or semi-autonomous business entities responsible for procurement, manufacturing and distribution activities associated with one or more families of related products” (Swaminathan *et al.* 1998).

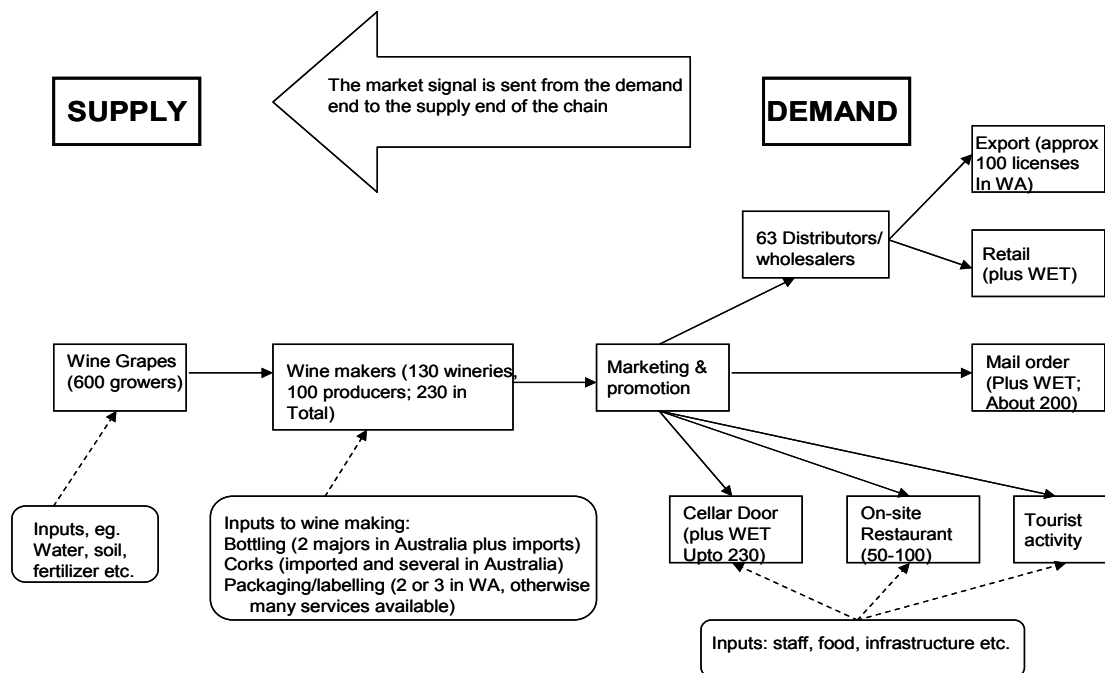


Figure 1: Supply Chain of WA wine industry (Thomas and Islam 2003)

Research in supply chain management had been extremely diverse. It varied from relationship management (Akkermans 2001), benchmarking and supply chain performance assessment (Lau et al. 2002) to the study of supply chain dynamics (Swaminathan et al 1998, Wilding 1998a, 1998b, Lee et al. 1997, Metters 1997; among many others). Our research aims to study the supply chain dynamics and relationship management. Akkermans (2001) proposes “Renga” (classical Japanese style of composing linked verse) approach to develop intra and inter-organizational networks. The author uses system dynamics (Forrester 1961, Senge 1990) as the method to jointly develop a model of collaborative supply chain management. Our research uses aspects of Akkermans’ approach to study the WA wine industry supply chain model. Swaminathan et al. (1998) describes a framework (called multiagent approach) of modelling supply chain dynamics. The authors essentially use a simulation model (with re-usable modules) of the supply chain.

A number of studies have been conducted dealing with chaos and bullwhip effect in supply chains. These are essentially various forms of dynamics portrayed by various supply chain systems. Wilding (1998a, 1998b) shows that supply chains can demonstrate key characteristics of deterministic chaotic systems. Being deterministic these systems follow some rules with no random terms governing the dynamics (Wilding 1998a). The author argues that uncertainties in supply and demand are the main reasons of chaos in supply chains. It is argued that the WA wine industry supply chain also displays some form of deterministic chaotic behaviour, the exact form of which is the subject of this research. Lee et al (1997) show that almost all supply chains demonstrate bullwhip effect. Bullwhip effect is a phenomenon where a slight variability in sales of a product results in huge variabilities in the upstream orders of the same product. For example, Lee et al. (1997) found that Proctor & Gamble’s pampers sales were fluctuating slightly. But corresponding orders for pampers by the distributors were fluctuating by a very large margin. The popular “Beer Game” illustrates the bullwhip effect in a simulation environment (Sterman 1989). The beer game illustrates that feedback system and irrational decision-making by various parties are the main reasons of bullwhip effect. Lee et al. (1997) identified four major causes of bullwhip effect in supply chains. These are demand forecast updating, order batching, price fluctuation and rationing and shortage gaming. Metters (1997) presents how bullwhip effect can be quantified by using a dynamic programming approach.

It is argued that “uncertainties” in various stages of the supply chain play major roles in the undesirable behaviour of the supply chain dynamics. This paper thus identifies and measures the uncertainties in the WA wine industry.

RESEARCH METHOD AND DESIGN

In line with the above literature figure 2 presents the research model of this study.

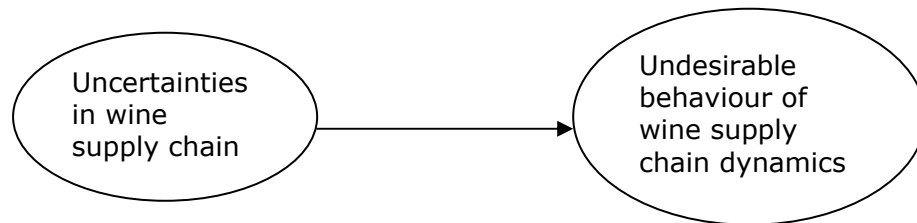


Figure 2: The research model

As mentioned before, we hypothesize that uncertainties in various stages of the wine supply chain are major reasons of undesirable behaviour of wine supply chain dynamics. It is noted that in the 2nd phase of this study we shall make use of these uncertainties to model the wine supply chain dynamics.

We take an exploratory approach to identify and appraise the uncertainties of the WA wine supply chain. In order to do this we selected a group of WA wine industry stakeholders and invited them to participate in an electronic focus group session. It must be noted that our purpose was to identify the uncertainties from the perceptions of the stakeholders (ie. from the field), not from the literature review as traditionally done in many studies. Extensive invitations were thus sent to various groups of stakeholders including wine producers, viticulturists, wine makers distributors/wholesalers, exporters/retailers and public and private consultants. After much effort a group of eight stakeholders agreed to participate in our research. This group was then invited to an electronic focus group session.

The electronic focus group session was conducted using the Group Support System (GSS) technology at Curtin Graduate School of Business (GSB). The Strategic Communication (STRATCOM) facility of Curtin GSB is equipped with a GSS technology called MeetingWorks (<http://www.entsol.com/>). GSS is a computer-based system used to support goal directed task of a group of people. A GSS session is facilitated by a team of two people: a facilitator and a chauffeur who runs the computer system. Using GSS the sources of the uncertainties of WA wine supply chain are *generated, discussed, and evaluated* as perceived by the stakeholders.

One of the authors used his extensive WA wine industry contacts to identify and invite prospective stakeholders to participate in our study. We eventually settled with 8 stakeholders who volunteered to participate in our research. The group session was conducted in November 2004. The session continued for three and a half hours. Before the session each group member was briefed on the aims and objectives of the study. The group session was conducted as follows:

- (i) The facilitator (one of the authors of this paper) welcomed the participants in the focus group session and highlighted the aims/objectives of the session and the script/procedure of the group session. The facilitator also discussed

the overarching question of the group session, which was: “*What are the sources of uncertainties in the WA wine industry supply chain?*” It was highlighted that the participants should consider the entire wine supply chain as depicted in figure 1.

- (ii) The chauffer (an outside consultant) briefly highlighted the technology side of the session.
- (iii) The group session started with *electronic brainstorming* – a module of the GSS technology which facilitates the computer aided brainstorming. Each participant used a laptop computer to enter their ideas into the GSS. From time to time the list of ideas was displayed in the common screen for everybody to have a look in order to generate more ideas. This phase of the group session was completely anonymous.
- (iv) After electronic brainstorming was completed the *discuss/organize* module of GSS was invoked. This module facilitates an open discussion on the brainstorming items of step (iii). In this step each item of step (iii) was discussed by the participants, similar items were grouped together (giving a new name, if necessary), and comments/discussions of the participants were captured by the chauffer into the GSS. The primary objective of this module is to come up with an agreed upon unique set of idea items in a group environment.
- (v) Finally, the *evaluate* module of GSS was used in order to evaluate the unique items of step (iv) in a group environment. In this module each participant rate the items in a scale of 1 (lowest rating) to 10 (highest rating). The GSS produces the average rating of each item along with the variance (a measure of disagreement) of the rating.

RESULTS

A group of 8 stakeholders from WA wine industry participated in the electronic focus group session. The research design, as presented earlier, was strictly followed to conduct the group session. The group first used the *electronic brainstorming* module of the GSS. In less than half an hour they came up with a list of 74 items of uncertainties in WA wine supply chain. The raw data is shown in Appendix I. The group then *discussed and organized* the 74 items and came up with 26 unique sources as shown in Table 1. Appendix II shows the full blown raw data of discuss/organize session for the group session.

Table 1 reveals a number of factors which are the prime sources of uncertainties in WA wine supply chain. It covers both supply and demand sides of the supply chain. For example, item number 2 “Lack of processing capacity for area under vine” is a supply side uncertainty. While, item number 19 “Marketing and promotion” is a demand side uncertainty. Other sources of uncertainties, for example item number 12 “storage and transport and logistics”, which cover the entire supply chain are also included.

Table 1: Organized themes/factors of the sources of uncertainties in WA wine industry

Average rating	Variance	Sources ¹
8.8	28%	12 storage and transport and logistics
8.3	42%	19 marketing and promotion
8.0	15%	16 consolidation
7.8	50%	10 stability of power supply
7.8	48%	21 government regulations
7.3	42%	4 labour shortages
7.3	65%	5 packaging materials
7.3	65%	25 industry complexity
7.0	41%	9 finding reputable importers/distributors
6.8	28%	15 demand forecasting
6.8	28%	2 lack of processing capacity for area under vine
6.5	24%	6 exchange rates
6.0	47%	7 immediate access to materials when breakdown (repairs and maintenance)
6.0	41%	8 water shortage and management of waste water
6.0	41%	17 non tarrif barriers
6.0	31%	26 increasing competition for suppliers in the world market creating shortages for the Australian buyers, eg barrels, machinery and packaging materials
5.5	24%	3 grape that we want when we need them
5.5	45%	1 uncontracted plantings
5.5	24%	20 trade and consumer education
5.5	45%	23 research and technology development
5.0	31%	13 fuel prices
4.8	28%	22 access to funds
4.8	59%	24 competition
3.8	55%	18 weather uncertainties
3.3	9%	11 rapid uncontrolled industry growth
2.3	9%	14 distance from the growers to winery

Note: ¹ The numbers correspond to the sources listed in Appendix II.

The group then *evaluated* the sources of Table 1 as per the research design using a scale of 1 (lowest) to 10 (highest). Figure 1 presents the results. The first column of Table 1 also reveals the average rating of the sources, with the variance reported in column 2. It is noted that item 12 "storage and transport and logistics" has the highest rating of 8.8 with a variance of 28%. This means that the majority in the group rate this source of uncertainty as being of highest importance. Other figures in the first two columns can be interpreted similarly. Ideally, the variance in column 2 should be less than 30%. However, no re-rating was conducted to reduce the variance for some of the uncertainties as the group felt that it was not worthwhile.

SOURCES OF UNCERTAINTIES OF WA WINE INDUSTRY SUPPLY CHAIN

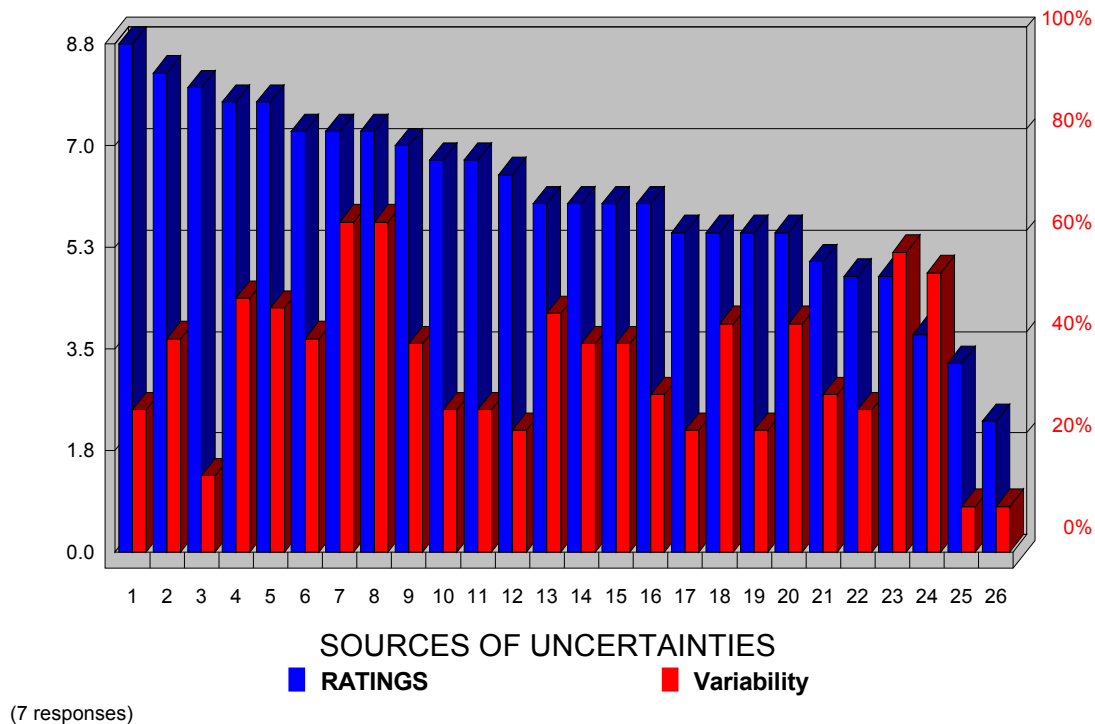


Figure 1: Evaluation of the sources of uncertainties
(refer to Table 1 for the sources)

CONCLUSIONS

This paper presents the results of the focus group session carried out with the selected WA wine industry stakeholders in order to identify the sources of uncertainties in wine industry supply chain. Computer aided Group Support Systems (GSS) is used for the group session, which is conducted at the Graduate School of Business, Curtin University of Technology.

The result suggests that sources of uncertainties in wine industry supply chain cover both supply and demand sides of the chain. A number of outside sources (eg. Government regulations) are also reflected in our findings.

Our immediate future goal is to develop a model based decision support system, which will make use of the uncertainties, to study the dynamics of WA wine supply chain.

REFERENCES

- Akkermans, H (2001), Renga: A Systems Approach to Facilitating Inter-Organizational Network Development, *Systems Dynamics Review*, Vol 17, No 3, pp. 179-193.
- Australian Wine and Brandy Corporation (AWBC) (2004a), *The Marketing Decade 2000-2010*, www.awbc.com.au (accessed in January 2004), 36pp.
- Australian Wine and Brandy Corporation (AWBC) (2004b), *Wine Export Approval Report*, www.awbc.com.au (accessed in February 2004), 2pp.
- Australian Wine and Brandy Corporation (AWBC) (2004c), www.awbc.com.au (various pages).
- Forrester, J W (1961), *Industrial Dynamics*, MIT Press: Cambridge, MA.
- Landeghem, H. V. and Vanmaele, H. (2002), Robust Planning: A New Paradigm for Demand Chain Planning, *Journal of Operations Management*, Vol 20, pp. 769-783.
- Lau, H C W., Pang, W K and Wong, C W Y (2002), Methodology for Monitoring Supply Chain Performance: A Fuzzy Logic Approach, *Logistics Information Management*, Vol 15, No 4, pp. 271-280.
- Lee, H L , Padmanabhan, V and Whang, S (1997), The Bullwhip Effect in Supply Chains, *Sloan Management Review*, Vol 38, No 3, pp. 93-102.
- Lee, Y H, Cho, M K, Kim, S. J. and Kim, Y. B (2002), Supply Chain Simulation with Discrete-Continuous Combined Modelling, *Computers and Industrial Engineering*, Vol 43, pp. 375-392.
- Metters, R (1997), Quantifying the Bullwhip Effect in Supply Chains, *Journal of Operations Management*, Vol 15, pp. 89-100.
- Ovellae, O R and Marquez, A C (2003), The Effectiveness of Using e-Collaboration Tools in the Supply Chain: An Assessment Study with System Dynamics, *Journal of Purchasing and Supply Management*, Vol. 9, pp. 151-163.
- Porter, M (1990), The Competitive Advantage of Nations, *Harvard Business Review*, March-April.
- Senge, P M (1990), *The Fifth Discipline: The Art and Practice of the Learning Organization*, Doubleday Currency,: New York.
- Stanford, L (2002), *After the Boom Supply Constraints Loom*, www.awbc.com.au (accessed in February 2004), 19pp.
- Swaminathan, J M, Smith, S F and Sadeh N M (1998), Modelling Supply Chain Dynamics: A Multiagent Approach, *Decision Sciences*, Vol 29, No 3, pp. 607-632.
- Thomas, G and Islam, N (2003), *Supply Chain Competitiveness of the WA Wine Industry*, Department of Agriculture WA, Perth, 60 Pages.
- Tywoniak, S A (2004), *Note on Data on Wine Industry*, Graduate School of Business, Curtin University of Technology, Perth.
- Wilding, R D (1998a), Chaos Theory: Implications for Supply Chain Management, *International Journal of Logistics Management*, Vol 9, No 1, pp. 43-56.
- Wilding, R D (1998b), The Supply Chain Complexity Triangle: Uncertainty Generation in the Supply Chain, *International Journal of Physical Distribution & Logistics Management*, Vol 28, No 8, pp. 599-616.

APPENDIX I

List of Brainstorming Items of the Group Session (Raw Data as entered by the wine industry stakeholders)

1. uncontracted plantings
2. lack of processing capacity for area under vine
3. grape that we want when we need them
4. labour shortages
5. packaging materials delivered on time
6. Exchange rates
7. immediate access to materials when breakdown
8. supply of sauvignon blanc
9. over production of grapes
10. continuity of supply from overseas markets
11. water restrictions on processing
12. service access for electronic breakdown
13. Finding reputable importers in international markets
14. stability of power supply
15. Rapid uncontrolled industry growth
16. water restrictions on growing
17. supply of semillon
18. temperature control of warehouse storage
19. distance from the growers to winery
20. oversupply of cabernet
21. grape supply, especially to receive crop level and crop condition as contracted.
22. demand exceeding supply causing shortages
23. consolidation of suppliers leading to limitation in choice of bottles
24. lack of broad range distributors in Australia
25. technical trade barriers being applied in export markets
26. lack of coordination between buyers to obtain bulk buying advantages
27. interstate shipping frequency leading to delays in product to market
28. bottle closures, especially screw caps that have an extended waiting period.
29. lack of small specialised distributors in Australia
30. some bottle types are in short supply.
31. weather uncertainties
32. china affect of boat schedules for export shipments
33. lack of planning on behalf of purchasers
34. shortage of packaging goods
35. weather
36. marketing and promotion in international markets. Australian, Western Australian and company branding issues. Decisions as to which form of promotion (media, trade shows etc), costs of promotion and selection of partners (eg. government, WIAWA).
37. education of prospective wine consumers in Australia
38. many trucking companies only leave Perth on a Tuesday or Friday which can impact on meeting shipping schedules.
39. bottling
40. market changes in preferred wine styles leaving stock unsold

41. government impositions - taxes on products needed by producers
42. the locating of distributors in export markets
43. increasing fuel prices
44. finding niche market opportunities for each type of wine.
45. service provision
46. lack of capital
47. the need to have all wine approved for export in Adelaide can cause delays if you receive orders with short lead times.
48. moving stock to other markets if export orders fail
49. label requirements limiting movement of stock to other markets
50. environmental regulations
51. with consolidated containers waiting for other suppliers can create problems in getting your wine to market.
52. availability of labour
53. urban encroachment
54. financial ability to meet supermarket and hotel order systems
55. labelling for export
56. supply of pallets.
57. maintaining quality control of grapes in a growing competitive market
58. coordination of shipping
59. just in time ordering meaning products not always on shelf due to delivery issues
60. shipping schedules.
61. continuation of funding for research
62. costs of wine education in developing markets, particularly Asian markets with high growth potential, to which we have a freight advantage. Activities need to be coordinated and prioritised to maximise relatively small fund pool.
63. export approvals
64. capital issue
65. limited options of choice for bottling operators
66. identifying niche markets
67. rivalry
68. language and cultural barriers
69. cost of investment in distribution channels
70. trying to minimise costs prior to packaging thus limited choice
71. many overseas shipments are required to be shipped from eastern states ports which extend transport times.
72. information overload for small producers
73. Increasing competition in the world market creating shortages for the Australian market
74. transshipping

APPENDIX II

Discussion Mode Results (raw data) of the Group Session

1. Uncontracted plantings

- 1.1 major issue - how it impacts on supply chain - not getting the grapes that you contracted for, either in quantity or condition
- 1.2 issue for grape grower who can't sell grapes
- 1.3 bad business to put something in the ground without a market for it
- 1.4 lot of people now who are uncontracted but were contracted - left hanging
- 1.5 happens that growers want the industry to take red along with white
- 1.6 industry not associated with wine industry putting in significant size vineyard which will have an effect down the track - forestry industry money into wine industry
- 1.7 last year's crop went up 45% - 96,000 tons
- 1.8 over production of grapes
- 1.9 rapid uncontrolled industry growth

2. lack of processing capacity for area under vine

- 2.1 not enough wineries
- 2.2 not enough storage capacity and not enough physical production per hour capacity
- 2.3 impact on timing and overall capacity
- 2.4 bottling
- 2.5 limited options of choice for bottling operators

3. grape that we want when we need them

- 3.1 supply what demand needs at the right time
- 3.2 if season is cool and harvest is delayed can impact on marketing decision on getting wines out within a certain time frame
- 3.3 supply of sauvignon Blanc
- 3.4 supply of semillon
- 3.5 oversupply of cabernet
- 3.6 lot of people are grafting at the moment - do we have enough grafters?
- 3.7 grape supply, especially to receive crop level and crop condition as contracted.
- 3.8 maintaining quality control of grapes in a growing competitive market

4. labour shortages

- 4.1 and skill shortage - lack of vineyard people and skilled labour
- 4.2 like French industry - locals don't want to do the work
- 4.3 reliant on backpackers - other events (eg Sars, 9/11) control whether they travel
- 4.4 tax forms - not allowed to employ people with tax number
- 4.5 availability of labour

5. packaging materials

- 5.1 timely delivery
- 5.2 can't get bottles, screw tops and bottles to put them on - producers have limitations on manufacture and a lot of people are moving to screw top

- 5.3 imported bottles are not always available because of take over agreements
- 5.4 no manufacture of glass in WA - trucked railed or shipped over - if change in anything it can mean glass is not available for small producer - relying on contractor to bottle can mean delays are critical
- 5.5 mobile bottling plants
- 5.6 continuity of supply machinery, packaging materials, expertise from overseas markets
- 5.7 bottle closures, especially screw caps that have an extended waiting period.
- 5.8 Some bottle types are in short supply.
- 5.9 shortage of packaging goods
- 5.10 trying to minimise costs prior to packaging thus limited choice
 - 5.10.1 bulk buying - ordering stock for 2 year supply
 - 5.10.2 imported bottles vs local bottles

6. Exchange rates

- 6.1 uncontrollable risk - US market is big issue

7. immediate access to materials when breakdown (repairs and maintenance)

- 7.1 gear and technicians have to come from Eastern States
- 7.2 continuity of supply machinery, packaging materials, expertise from overseas markets
- 7.3 service access for electronic breakdown
- 7.4 service provision

8. water shortage and management of waste water

- 8.1 water restrictions on processing
- 8.2 water restrictions on growing

9. finding reputable importers/distributors

- 9.1 finding reputable importers/distributors in international markets.
- 9.2 lack of small specialised distributors in Australia
- 9.3 the locating of distributors in export markets
- 9.4 moving stock to other markets if export orders fail
- 9.5 cost of investment in distribution channels

10. stability of power supply

- 10.1 massive problem in Great Southern and whole South West
- 10.2 every time it rains during summer - supply fails whenever you need it

11. Rapid uncontrolled industry growth

- 11.1 growth of wine industry and not being able to sell it into the market place

12. storage and transport and logistics

- 12.1 temperature control of warehouse storage/transport
 - 12.1. maintaining quality control
- 12.2 interstate shipping frequency leading to delays in product to market
- 12.3 China affect of boat schedules for export shipments
- 12.4 physical supply of containers is out of balance throughout the world
- 12.5 many trucking companies only leave Perth on a Tuesday or Friday which can impact on meeting shipping schedules.
- 12.6 With consolidated containers waiting for other suppliers can create problems in getting your wine to market.
- 12.7 financial ability to meet supermarket and hotel order systems
- 12.8 Supply of pallets.
- 12.9 coordination of shipping

- 12.10 just in time ordering meaning products not always on shelf due to delivery issues
- 12.11 shipping schedules.
- 12.12 many overseas shipments are required to be shipped from Eastern States ports which extend transport times.
- 12.13 transshipping
- 13. fuel prices**
- 14. distance from the growers to winery**
 - 14.1 fuel cost
 - 14.2 logistics/quality issues
- 15. demand forecasting**
 - 15.1 demand exceeding supply causing shortages
 - 15.2 lack of planning on behalf of purchasers
 - 15.3 market changes in preferred wine styles leaving stock unsold
- 16. consolidation**
 - 16.1 consolidation reducing competition amongst suppliers
 - 16.1.1 consolidation reducing competition amongst suppliers
 - 16.1.1.1 consolidation of suppliers leading to limitation in choice of bottles
 - 16.1.1.1.1 lack of competition among suppliers
 - 16.2 consolidation of purchasers reducing competition
 - 16.2.1 lack of broad range distributors in Australia
 - 16.3 lack of coordination between buyers to obtain bulk buying advantages
 - 16.3.1 to get better deals
- 17. non tariff barriers**
 - 17.1 technical trade barriers being applied in export markets
 - 17.2 label requirements limiting movement of stock to other markets
 - 17.3 labelling for export
- 18. weather uncertainties**
 - 18.1 need to consider ways of alternatives
- 19. marketing and promotion**
 - 19.1 marketing and promotion in international markets. Australian, Western Australian and company branding issues. Decisions as to which form of promotion (media, trade shows etc), costs of promotion and selection of partners (eg. government, WIAWA).
 - 19.2 finding niche market opportunities for each type of wine.
 - 19.3 Costs of wine education in developing markets, particularly Asian markets with high growth potential, to which we have a freight advantage. Activities need to be coordinated and prioritised to maximise relatively small fund pool.
 - 19.4 identifying niche markets
 - 19.5 language and cultural barriers
 - 19.6 cost of investment in distribution channels
- 20. trade and consumer education**
 - 20.1 education of prospective wine consumers in Australia
- 21. Government regulations**
 - 21.1 government impositions - taxes on products needed by producers
 - 21.2 The need to have all wine approved for export in Adelaide can cause delays if you receive orders with short lead times.
 - 21.3 label requirements limiting movement of stock to other markets
 - 21.4 environmental regulations
 - 21.4.1 sprays, noise, road regulations

- 21.5 urban and special rural encroachment
 - 21.5.1 working at night for 3 months of the year
- 21.6 export approvals

22. access to funds

- 22.1 misdirection of capital
- 22.2 working capital
- 22.3 capital issue

23. research and technology development

- 23.1 continuation of funding for research

24. competition

- 24.1 increased supply but not necessarily an increase in demand
- 24.2 economies of scale

25. industry complexity

information overload for small producers

26. Increasing competition for suppliers in the world market creating shortages for the Australian buyers, eg barrels, machinery and packaging materials