

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

# **The Pipfruit Export Season at the Port of Napier Container Terminal: an Exploratory Case Study**

A thesis submitted in partial fulfilment of the requirements for the degree of

**Master of Logistics and Supply Chain Management**

at Massey University

Palmerston North Campus

New Zealand

**Karl Mberikwazvo Tichatonga Mudzamba**

2010

## **Abstract**

This is an exploratory study seeking to gain a better understanding of seasonality at the Port of Napier container terminal. It seeks to explore the motives behind the actions of the pipfruit exporters, and analyse the impact seasonal reefer (refrigerated containers) volumes have on terminal operations. The case study method is employed because it reflects the interpretive assumptions adopted for the study, and has the tools to analyse the qualitative and quantitative data collected.

The study revealed the exporters source most of their fruit from their own and leased orchards. The guaranteed volumes justify the investments made in fruit handling facilities. The balance of their fruit comes from contract growers where the exporters seek to establish long term relationships to minimise supply uncertainty. The exporters look to using their own fruit handling facilities, before passing any fruit to third parties, because of the greater flexibility afforded by prioritising shipments in their own facilities.

The exporters have invested in information systems that have automated most of the previously manual processes, and assist with managing the complexity of compliance, improving visibility in their operations, and satisfying the traceability requirements of their customers. The exporters have retail programs in place with customers in their traditional markets (US and Europe) that enable them to manage their work load for the entire season. The exporters have increasingly directed marketing efforts to the fixed price markets in mostly Asia, the Middle East and Russia, because the upfront payments, shorter transit times and fixed prices, reduce the risk of serving the markets. The fixed price sales are very much on short notice and present unique challenges on logistic systems, as the emphasis is on expediting shipments to get the best prices. The success of exclusive varieties and licensed orchards give the exporters much hope, particularly with the latter, as they are able to maintain fresh supplies all year round.

The exporters select shipping lines on the basis of transit times and port calls but are in reality, at the mercy of the powerful shipping lines. They have to base their marketing plans on the schedules of the lines. Chartering offers a way around the rigid schedules of the shipping lines, though only one exporter currently exercises this option.

The impact of the pipfruit export season in the terminal is evident on its impact on several aspects of terminal operations. Container vessel calls increase, as shipping lines deploy 'extra loaders' to complement their regular services to deal with the added cargo volumes. Vessel exchange times lengthen to reflect the increase in containers exchanged. Reefer capacity utilisation rises well above the average, though reefer dwell times decrease to reflect the pressure exporters work under during the season that almost reduces them to packing reefers just-in-time for vessels. The number of rehandles rises to mimic the added container volumes as the terminal employs strategies to cope with the scarcity of reefer space.

## **Acknowledgments**

Firstly I'd like to thank the staff members at the College of Science at Massey, my supervisor Dr Norman Marr for the invaluable advice and guidance throughout a journey of self discovery, Alan Win for his encouragement and Kathy Hamilton for fielding and answering countless questions from me.

My research would not have been possible were it for the help I got from Christine McRae and Rex Graham in the early days of my research. I'm eternally grateful to all the exporter's representatives who I cannot name who agreed to talk to me. I'd like to thank several colleagues at the Port of Napier, Chris Bain and Guy Stone for kindly allowing me to conduct my research, Tony Des Landes and Andrew Locke for their time and patience in my endless requests for contacts and information.

A very special thank you goes to my parents, the most generous people I've ever known, thank you for all your encouragement and belief in me. I'd also like to thank Natasha for the constant words of encouragement, taking over cooking duties when I had to get my head down, and for being a sounding board for my thoughts. Another special thank you goes to the rest of my family who supported and encouraged me throughout. My good friends Nelson and Mandy Gapare proved an inspiration to me, I feel privileged to call them my friends. I'm indebted to Ethel Matshiya who kindly agreed to proof read my thesis from so far away! Last but not least I'd like thank God for giving me the opportunities I've had to chase my dreams.

# Table of Contents

<b>Abstract.....</b>	<b>ii</b>
<b>Acknowledgements .....</b>	<b>iii</b>
<b>Table of Contents .....</b>	<b>iv</b>
<b>List of Tables .....</b>	<b>vii</b>
<b>List of Figures.....</b>	<b>viii</b>
<b>Chapter 1: Introduction .....</b>	<b>1</b>
1.1 Introduction.....	1
1.2 Background to Study .....	1
1.3 Problem Definition .....	4
1.4 Research Objectives and Questions .....	6
1.5 Outline of Thesis.....	6
<b>Chapter 2: Industry Review.....</b>	<b>8</b>
2.1 Introduction.....	8
2.2 History .....	8
2.3 Current Situation.....	19
2.4 Future development .....	21
2.5 Summary.....	23
<b>Chapter 3: Literature Review.....</b>	<b>25</b>
3.1 Introduction.....	25
3.2 Container Handling Equipment Systems .....	25
3.3 Rehandles.....	28
3.3.1 Sources of Rehandles.....	28
3.3.2 Rehandling Export Containers.....	30
3.3.3 Rehandling Import Containers.....	33
3.4 Capacity Issues .....	35
3.4.1 Capacity Constraints in Terminals.....	35
3.4.2 Inland/Satellite Container Terminals.....	40

3.5 Summary.....	42
<b>Chapter 4: Research Methodology.....</b>	<b>44</b>
4.1 Introduction.....	44
4.2 Research Objectives.....	44
4.3 Research Paradigms.....	44
4.4 Methodology.....	48
4.4.1 The Case Study.....	48
4.5 Research Methods.....	51
4.5.1 Sampling.....	51
4.5.2 Interview.....	52
4.5.3 Archival Searching for Secondary Data.....	53
4.6 Data Analysis.....	54
4.6.1 Content Analysis.....	55
4.7 Validity and Reliability.....	56
4.8 Ethical Issues.....	58
<b>Chapter 5: The Pipfruit Exporters.....</b>	<b>60</b>
5.1 Introduction.....	60
5.2 The Supply Base.....	60
5.3 The Logistics Network.....	64
5.4 Information Systems.....	72
5.5 Selling Arrangements.....	76
5.6 Shipping Matters.....	81
5.7 Looking Ahead.....	87
<b>Chapter 6: The Port of Napier Container Terminal.....</b>	<b>90</b>
6.1 Introduction.....	90
6.2 Export Handling.....	91
6.3 The Pipfruit Export Season.....	93
6.3.1 Pipfruit Volumes.....	93

6.3.2 Shipment Operations .....	95
6.3.3 Reefer Capacity Utilisation.....	97
6.3.4 Container Dwell Times.....	100
6.3.5 Rehandles.....	101
<b>Chapter 7: Conclusions .....</b>	<b>104</b>
7.1 Introduction.....	104
7.2 Conclusions.....	104
7.2.1 The Motives Behind the Actions of the Exporter .....	104
7.2.2 Analysis of the Impact Seasonal Reefer Cargo has on Terminal Operations ....	108
7.3 Limitations .....	109
7.4 Future Research .....	110
<b>References.....</b>	<b>111</b>
<b>Appendices.....</b>	<b>117</b>
Appendix A: Interview Request Email .....	117
Appendix B: Interview Questionnaire .....	118

## **List of Tables**

Table 2.1 – Current and Forecasts of Exports Volumes and Value .....	22
Table 4.1 – Alternative Terms for the Two Main Research Paradigms.....	45
Table 6.1 – Container Handled in the Terminal in 2008 and 2009.....	90



## List of Figures

Figure 1.1 - The Port of Napier's Container Volumes 2000-2009 .....	3
Figure 2.1 – Exports by Volume and Value.....	15
Figure 2.2 – The Value of the New Zealand Dollar Against Three Major Currencies .....	17
Figure 3.1 – ‘1 over 2’ Straddle Carriers .....	25
Figure 3.2 – Three Dimensional and Cross Sectional View of a Yard Crane Block .....	26
Figure 3.3 – Cross Section of a Reachstacker/Forklift Bay .....	27
Figure 3.4 – Reachstacker Retrieving a Container from the Second Row.....	28
Figure 6.1 – The Expert Decking Process.....	92
Figure 6.2 – The Top Six Reefer Commodities by Volume for 2008.....	94
Figure 6.3 – The Top Six Reefer Commodities by Volume for 2009.....	94
Figure 6.4 – Container Vessel Calls 2008 – 2009.....	95
Figure 6.5 – Average Vessel Turnaround Time 2008 -2009 .....	96
Figure 6.6 - Average Number of Live Reefers in Port per Day .....	98
Figure 6.7 – Two-way Access Bay .....	99
Figure 6.8 – One-way Access Bay .....	99
Figure 6.9 – Average Reefer Dwell Time.....	101
Figure 6.10 – Rehandles 2008 – 2009.....	102
Figure 6.11 – Bays Showing Containers with a Change of Vessel.....	103