

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.

**PERFORMANCE AND MANAGEMENT CHARACTERISTICS  
OF WAIRARAPA AND TARARUA WOOL PRODUCTION  
SYSTEMS.**

**R. G. Gavigan  
April 1994**

**A thesis presented in partial fulfilment of the requirements for the  
degree of Master of Agricultural Science in Farm Management at  
Massey University.**

Massey University Library  
Thesis Copyright Form

Title of thesis: *Performance and Management Characteristics of  
Wairarapa and Tairāra Wool Production Dept*

- (1) (a) I give permission for my thesis to be made available to readers in Massey University Library under conditions determined by the Librarian.
- (b) I do not wish my thesis to be made available to readers without my written consent for ... months.
- (2) (a) I agree that my thesis, or a copy, may be sent to another institution under conditions determined by the Librarian.
- (b) I do not wish my thesis, or a copy, to be sent to another institution without my written consent for ... months.
- (3) (a) I agree that my thesis may be copied for Library use.
- (b) I do not wish my thesis to be copied for Library use for ... months.

Signed .

*D. G. Coy* <sup>GAVIGAN</sup>

Date

*29/4/1994*

The copyright of this thesis belongs to the author. Readers must sign their name in the space below to show that they recognise this. They are asked to add their permanent address.

NAME AND ADDRESS

DATE

## ACKNOWLEDGEMENTS

I wish to express my thanks to Professor Warren J. Parker for his guidance and assistance throughout this study. I am also appreciative of the assistance and support provided by other staff, and students, of the Department of Agricultural and Horticultural Systems Management at Massey University.

I am indebted to the New Zealand Wool Board, in particular Messrs Lance Wiggins and John Hutchinson, for the opportunity to complete this study. The New Zealand Wool Board are very generous employers, and I look forward to my continued role within the Grower Services Division.

I am very grateful to the Wairarapa/Tararua farmers who made their farms available for the survey. Their cooperation and friendly hospitality made the field work a highlight of the study.

I would like to thank my colleague, Dr Ken Geenty, for his encouragement to undertake this study, and interest throughout. Thanks also to Jill Beedie and Sue Rivers of 'Office Solutions', for their support during the last two years.

Thanks must go to Sue Rivers for her skill and efficiency in preparing this manuscript.

Finally, I must acknowledge the patience and support of my family and friends. I look forward to spending much more time with them in the future.

I dedicate this work to my parents, Colleen and Gordon, who have always encouraged my education.

I accept responsibility for any errors or omissions in this report.

## ABSTRACT

In 1992/93 the New Zealand wool industry was based on approximately 52.5 million sheep that produced 255500 tonnes of greasy wool. The New Zealand Wool Board Grower Services Group, among others, provided the 24000 sheep farmers involved in wool production with management advice and technical assistance in growing and harvesting wool which was subsequently sold, exported, processed and promoted by a network of wool industry participants.

The purpose of this study was to :

- compile a detailed database of Wairarapa/Tararua wool production systems.
- compare the database compiled with existing databases to test their suitability for describing Wairarapa/Tararua wool production systems.
- identify management variable that may be important in achieving high levels of wool production and returns.
- identify methods to improve New Zealand Wool Board extension in the Wairarapa/Tararua region.

This was achieved by a combined mail and personal interview survey of a stratified random sample of 75 Wairarapa/Tararua wool producers. Descriptive statistical methods were used to describe the physical and financial characteristics of wool production systems and the management systems employed. Multiple regression analysis was used to estimate the relative importance of different management strategies and farm physical characteristics on wool production and clean wool price.

Few significant differences in mean wool production system performance within farm class, summer rainfall, sheep flock size and summer rainfall/farm class groupings were noted in the study. Thus, the Wairarapa/Tararua region was relatively homogeneous in terms of wool production system performance over the past three seasons. A large range in values for most wool performance parameters suggested that wool production system performance on individual farms was influenced more by management variables than by farm physical attributes.

A comparison of the New Zealand Meat and Wool Boards' Economic Service (NZMWBES) Sheep and Beef Farm Survey and Wairarapa Farm Improvement Club (WFIC) databases with data collected in this study indicated that NZMWBES and WFIC data were satisfactory for describing some, but not all of the characteristics of wool production systems in the region. Therefore, in order to maintain a representative overview of Wairarapa/Tararua wool production systems it is recommended that this study should be regularly updated.

Aspects of wool production systems that could be improved on many Wairarapa/Tararua sheep farms mainly related to : the quantification of sheep breeding objectives; use of objective criteria for replacement ewe hogget and ram selection; improved summer feeding of mixed age ewes (if wool prices improve); and improved marketing (objective measurement and offer of wool to a wider range of buyers) of privately sold wool. These aspects can be addressed by New Zealand Wool Board mass extension activities, primarily through newspapers and free publications. While improvements in management for wool production are likely to increase monetary returns to the regions' wool producers, they should be promoted in the context of assisting individual wool producers to achieve their personal goals/objectives.

## TABLE OF CONTENTS

		Page No.
<b>CHAPTER ONE: INTRODUCTION</b>		
1.0	Chapter outline	1
1.1	The New Zealand wool industry	1
1.1.1	Export earnings	1
1.1.2	Sheep farms	2
1.1.3	Sheep numbers	4
1.1.4	Wool production	5
1.1.5	Wool harvesting	7
1.1.6	Wool selling	8
1.1.7	Wool scouring	11
1.1.8	Wool exporting	12
1.1.9	Wool price	13
1.1.10	Wool processing	15
1.1.11	New Zealand wool end uses	16
1.1.12	Promotion of New Zealand wool	17
1.1.13	Research and development	18
1.2	The New Zealand Wool Board	19
1.2.1	Formation and functions	19
1.2.2	New Zealand Wool Board activities	21
1.3	Purpose and scope of the study	24
1.4	Objectives of the study	26
<b>CHAPTER TWO: PREPARATION AND ADMINISTRATION OF THE SURVEY</b>		
2.0	Chapter outline	27
2.1	The Wairarapa/Tararua region	27
2.1.1	Location	27
2.1.2	Population	28
2.1.3	Servicing industries	30
2.1.4	Topography and soils	30
2.1.5	Climate	32
2.1.6	Pasture production	33
2.1.7	Sheep farming systems	34
2.1.8	Sheep and beef cattle farm extension services	36
2.1.9	Sheep and beef cattle farm performance	38

	Page No.
2.2 Selection of the survey area and survey farmers	42
2.2.1 Selection of the survey area	42
2.2.2 Selection of the survey farms	42
2.3 Schedule of interviews	47
2.4 Questionnaire design	48
2.4.1 Questionnaire layout	48
2.4.2 Question preparation	49
2.4.3 Pre-testing the questionnaire	50
2.5 Timing of the survey and interview procedure	51
2.6 Computer coding and analysis	54
2.7 Statistical analysis	55
<b>CHAPTER THREE: CHARACTERISTICS OF WAIRARAPA/TARARUA WOOL PRODUCTION SYSTEMS</b>	
3.0 Chapter outline	57
3.1 The farmers	57
3.1.1 Age and farming employment	57
3.1.2 Farmer aims	58
3.1.3 Farmers' attitudes towards the wool industry	59
3.1.4 New Zealand Wool Board performance	61
3.1.5 Agriculture-related publications read by farmers	63
3.1.6 Agriculture-related events attended by farmers	64
3.1.7 Discussion and application of results	66
3.1.8 Conclusions	69
3.2 Land, subdivision and livestock	70
3.2.1 Farm area	70
3.2.2 Subdivision	72
3.2.3 Livestock	73
3.2.4 Discussion and application of results	75
3.2.5 Conclusions	79
3.3 Lambing percentage and wool production	80
3.3.1 Lambing percentage	80
3.3.2 Wool production	82
3.3.3 Discussion and application of results	82
3.3.4 Conclusions	86
3.4 Financial returns for wool	87
3.4.1 Average clean wool price	87



	Page No.	
3.4.2	Wool income	88
3.4.3	Wool costs	89
3.4.4	Wool return	90
3.4.5	Discussion and application of results	91
3.4.6	Conclusions	96
3.5	Sheep breeding	97
3.5.1	Sheep breeding objectives	97
3.5.2	Ewe hogget selection	98
3.5.3	Ram selection	100
3.5.4	Discussion and application of results	103
3.5.5	Conclusions	108
3.6	Grazing management	109
3.6.1	Pasture shortage	109
3.6.2	Feeding priorities	110
3.6.3	Grazing management techniques	111
3.6.4	Fertiliser application	112
3.6.5	Sources of information for feeding/grazing management	112
3.6.6	Discussion and Application of results	113
3.6.7	Conclusions	116
3.7	Animal health	117
3.7.1	Sheep health challenges	117
3.7.2	Sources of information for animal health management	118
3.7.3	Discussion and application of results	118
3.7.4	Conclusions	119
3.8	Wool Harvesting	120
3.8.1	Shearing policy	120
3.8.2	Crutching policy	124
3.8.3	Clip Preparation	125
3.8.4	Discussion and application of results	127
3.8.5	Conclusions	130
3.9	Wool Selling	131
3.9.1	Method of selling	131
3.9.2	Sources of wool selling information	132
3.9.3	Discussion and application of results	133
3.9.4	Conclusions	136

**CHAPTER FOUR : INTEGRATION**

4.0	Introduction	137
4.1	Multiple regression analysis	139
4.1.1	Methodology	139
4.1.2	Dependent and explanatory variables	140
4.1.3	Results	143
4.2	Discussion and application of results	145
4.2.1	Wool production	145
4.2.2	Wool price	146
4.3	Conclusions	147

**CHAPTER FIVE: SUMMARY AND CONCLUSIONS**

5.0	Introduction	148
5.1	Evaluation of research methodology	150
5.2	Recommendations in relation to study objectives	151
5.2.1	Wool production system database	151
5.2.2	Database comparisons	152
5.2.3	Important management variables	153
5.2.4	Improving New Zealand Wool Board extension	154
5.3	Suggestions for further research	154

<b>REFERENCES</b>	<b>156</b>
-------------------	------------

**APPENDICES**

Appendix A:	New Zealand Meat and Wool Boards' Economic Service Farm Class definitions	176
Appendix B:	Wairarapa/Tararua survey questionnaire	178
Appendix C:	Individual summer rainfall/NZMWBES Farm Class category wool production system information	197

## FIGURES

1.1	New Zealand shorn wool sales by month	9
1.2	New Zealand wool fibre exports to major markets	13
1.3	New Zealand wool price and production (expressed in 1992/93 purchasing terms)	14
2.1	Location of the Wairarapa/Tararua region in relation to the North Island of New Zealand	29
2.2	Location of farms surveyed in the Wairarapa/Tararua region	53
3.1	Wool prices 1990/91 - 1992/93	93
5.1	Flowchart of the New Zealand wool industry	149

## TABLES

1.1	Classification of New Zealand sheep farming systems	3
1.2	New Zealand breeding ewe and ewe hogget numbers 1960 to 1992	5
1.3	New Zealand wool production	6
1.4	Categories of wool sold at auction	7
1.5	Method of sale of New Zealand wool 1987/88 to 1992/93	10
2.1	Monthly and annual rainfall (mm) for selected Wairarapa/Tararua sites	33
2.2	Comparison of NZMWBES and WFIC sheep and beef cattle farm performance indices for comparable class groupings (1990/91 data)	40
2.3	Comparison of NZMWBES East Coast North Island Production Region and WFIC all farms average performance indices (1990/91 data)	40
3.1	Age and farm-employment details of farmers surveyed	58
3.2	Main aim in farming of farmers surveyed	59
3.3	Perceptions of the future of the wool industry of farmers surveyed	60
3.4	Rating of New Zealand Wool Board performance by farmers surveyed	61
3.5	Agriculture-related publications read by farmers surveyed	63
3.6	Agriculture-related events attended by farmers surveyed	65
3.7	Agriculture-related events attended by farmers classified by number of sheep stock units wintered	65
3.8	Land, subdivision and livestock characteristics of farms classified by NZMWBES Farm Class	70
3.9	Land, subdivision and livestock characteristics of farms classified by summer rainfall category	71
3.10	Land, subdivision and livestock characteristics of farms classified by number of sheep stock units wintered	71

3.11	Land, subdivision and livestock characteristics of farms classified by summer rainfall/NZMWBES Farm Class category	72
3.12	Lambing percentage and wool production on farms classified by NZMWBES Farm Class	80
3.13	Lambing percentage and wool production on farms classified by summer rainfall category	81
3.14	Lambing percentage and wool production on farms classified by number of sheep stock units wintered	81
3.15	Lambing percentage and wool production on farms classified by summer rainfall/NZMWBES Farm Class category	82
3.16	Financial returns for wool and costs of harvesting wool on farms classified by NZMWBES Farm Class	88
3.17	Financial returns for wool and costs of harvesting wool on farms classified by summer rainfall category	89
3.18	Financial returns for wool and costs of harvesting wool on farms classified by number of sheep stock units wintered	90
3.19	Financial returns for wool and costs of harvesting wool on farms classified by summer rainfall/NZMWBES Farm Class category	91
3.20	Sheep breeding objectives of farmers surveyed	98
3.21	Replacement ewe hogget selection criteria used by farmers surveyed	99
3.22	Sources of advice/information, used by farms surveyed, to assist in selecting replacement ewe hoggets.	100
3.23	Ram selection criteria used by farmers surveyed	101
3.24	Sources of advice/information, used by farmers surveyed, to assist in selecting rams	102
3.25	Basis of decision from whom to purchase rams	103
3.26	Month of most severe pasture shortage on summer moist and summer dry farms surveyed	109
3.27	Livestock feeding priorities at time of summer feed shortage on farms surveyed	110
3.28	Livestock feeding priorities at time of winter feed shortage on farms surveyed	111
3.29	Use of grazing management techniques by survey farmers	112
3.30	Sources of advice/information used by farmers to assist with grazing management	113
3.31	Impact on sheep production of animal health problems on farms surveyed	117
3.32	Sources of advice/information used by survey farmers to assist with animal health management	118
3.33	Lamb, two tooth and mixed age ewe shearing policies used on farms surveyed	120
3.34	Month(s) of lamb shearing on farms with once-yearly or twice-yearly shearing policies	121
3.35	Month of hogget shearing on farms surveyed	121

	Page No.
3.36 Month(s) of two tooth shearing on farms with once-yearly or twice-yearly shearing policies	121
3.37 Month(s) of mixed age ewe shearing on farms with once-yearly, twice-yearly or eight-monthly shearing policies	122
3.38 Type of mixed age ewe shearing policy changes made by farmers surveyed	123
3.39 Reasons for changes in shearing policy	123
3.40 Hogget, two tooth and mixed age ewe crutching policies used on farms surveyed	124
3.41 Month of hogget crutching, two tooth crutching and mixed age ewe crutching on farms surveyed	125
3.42 Number of wool handlers employed per shearer at shearing time on farms surveyed	126
3.43 Sources of advice/information used by farmers to assist with wool clip preparation at shearing time	126
3.44 Types of and reasons for, wool selling policy changes made by farmers surveyed	132
3.45 Sources of advice/information used by farmers to assist with wool selling	133
4.1 Description of state and management variables included in a multiple regression model to predict average wool production per sheep stock unit	141
4.2 Description of state and management variables included in a multiple regression model to predict average net wool price	142
4.3 Simple correlation coefficients between wool production and wool price and explanatory variables	143
4.4 Variables remaining in the wool production estimating equation after backward elimination	144
4.5 Variables remaining in the wool price estimating equation after backward elimination	144