

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.

LAND USE IN THE MANAWATU -
POSSIBLE IMPACT OF A NEW AGRICULTURAL PROCESSING INDUSTRY

A thesis presented in partial
fulfilment of the requirements for the degree
of Master of Arts
in Geography at
Massey University

ROWENA MARGARET RIDLER

1978

ABSTRACT

The decision of the Canterbury (N.Z.) Malting Company to expand and to locate its second barley processing plant near Marton has meant that considerable land use changes may occur in the surrounding farming area, particularly the Manawatu coastal lowlands and terraces.

A mail survey of 600 farmers in the Kairanga, Manawatu, Oroua and part of the Rangitikei counties found that of those responding, 51 farmers had definite intentions of growing barley for processing into malt and 74 possibly would do so. It was difficult to establish how much land would be affected because policy matters, such as returns, had not been established at the time of the survey. The plant requires over 30,000 tonnes or 7,000 hectares of barley annually once maltings are in full operation.

Interesting observations were able to be made, however, with respect to characteristics of farmers likely to grow malting barley, how information about the malting barley plant has been diffused, and attitudes of farmers towards growing barley and engaging in contracts.

The Manawatu is now an established mixed cropping and fat lamb farming region and the establishment of the malting barley plant should strengthen this position. Land use changes may occur in terms of changing cropping patterns if malting barley replaces other crops, but the impression gained is that most of the malting barley will be grown on land formerly in pasture. The nature of barley as a crop, with a short growing period and the ability of the pasture to be renewed with improved species in winter, means that the increased cropping may be complementary to the existing cropping/fattening pattern and enhance agricultural productivity in the region.

ACKNOWLEDGEMENTS

Many friends and colleagues have offered moral support and practical help during the three years of my Masterate studies. With reference to this thesis I wish to thank in particular:

- my Supervisor, Mr E.C.R. Warr of the Geography Department, assisted by Dr A.D. Meister of the Agricultural Economics Department;
- Professor Thomson and other members of the Geography Department, notably Mr R.G. Heerdegen and Dr A.C. Walsh and the secretarial staff;
- staff of the Photographic Unit, Massey University;
- Mr H.P. Kearney, Manager of the Canterbury (N.Z.) Malting Company, and Research Officers Philip Wauchop and John Biggs;
- Peter Whitehead and Ian Lamb for introducing me to the realm of the computer world;
- on the domestic front, considerable help has been proffered by my parents, Win and Allen Coulter, and Karitane Nurse Colleen Oldfield;
- most importantly, I am indebted to the forbearance of my three small children - David, Anne and Clare - and especially to my husband Barrie who has alternately bullied and supported me throughout my studies.

CONTENTS

| | Page |
|--|------|
| ABSTRACT | ii |
| ACKNOWLEDGEMENTS | iii |
| LIST OF TABLES | v |
| LIST OF FIGURES | vi |
| | |
| CHAPTER ONE : RESEARCH PROBLEM AND DESIGN | 1 |
| Description of the Problem | 1 |
| Aims of the Study | 2 |
| Nature of Agricultural Geography | 3 |
| Research Design | 5 |
| Propositions | 5 |
| Data Gathering | 7 |
| Data Analysis | 15 |
| | |
| CHAPTER TWO : THE STUDY REGION | 17 |
| Topography, Soil Type and Agricultural Use | 19 |
| Coastal Lowlands | 19 |
| The Ranges | 23 |
| Climate | 24 |
| Transport and Communications | 25 |
| Development of a Land Use Region | 25 |
| The Development of the Manawatu as a Land Use Region | 26 |
| Cropping in the Study Area | 29 |
| | |
| CHAPTER THREE: INNOVATION ADOPTION AND DIFFUSION | 33 |
| Studies of Innovation Adoption and Diffusion | 35 |
| Characteristics of the Innovation | 36 |
| Stages in the Adoption Process | 38 |
| Rate of Adoption | 42 |
| Predicting Innovativeness | 44 |
| Proposition One Tested | 47 |
| The Diffusion Process | 53 |
| Proposition Two Tested | 56 |

| | Page |
|--|------------|
| CHAPTER FOUR : TOWARDS UNDERSTANDING CURRENT LAND USE PATTERNS | 61 |
| Early Location Models - Ricardo and Von Thunen | 62 |
| Economic Models | 65 |
| Input - Output Models | 65 |
| Spatial Equilibrium Models | 66 |
| Decision Making Models | 67 |
| Game Theory | 67 |
| Diffusion Models | 69 |
| Behavioural Models | 71 |
| CHAPTER FIVE : POSSIBLE IMPACT OF THE MALTING PLANT ON THE CURRENT LAND USE PATTERN | 74 |
| Systems Theory | 74 |
| Proposition Three | 78 |
| Proposition 3.A | 79 |
| Proposition 3.B. | 89 |
| Proposition 3.C | 93 |
| Proposition 3.D | 96 |
| CHAPTER SIX : POSSIBLE IMPACT OF THE MALTING BARLEY PLANT ON THE ECONOMIC LIFE OF THE REGION | 99 |
| Regional Development Theories | 100 |
| Growth Pole or Growth Centre Theory | 101 |
| Export Base Theory | 101 |
| The Malting Barley Plant | 102 |
| Proposition Four | 105 |
| Seed and Grain Merchants | 105 |
| Contractors | 106 |
| CHAPTER SEVEN: SUMMARY AND CONCLUSIONS | 108 |
| APPENDICES | 113 |
| BIBLIOGRAPHY | 140 |

LIST OF TABLES

| Table | | Page |
|-------|---|------|
| 1.1 | Sample frame | 8 |
| 2.1 | Potential and actual crop land by county, 1975-1976 | 17 |
| 2.2 | Area and yield of crops by county, 1976-1977 | 30 |
| 2.3 | Mean area of farms by county, 1978 | 31 |
| 2.4 | Total area of crops, 1978 | 31 |
| 3.1 | Summary of results, proposition one | 51 |
| 3.2 | Sources of information about malting barley plant | 58 |
| 5.1 | Comparison of 1977-1978 and 1978-1979 cropping areas | 81 |
| 5.2 | Gross margins for crops, 1978-1979. | 81 |
| 5.3 | Reasons for growing barley in past. | 83 |
| 5.4 | Comparison of incentives | 84 |
| 5.5 | Comparison of disincentives | 85 |
| 5.6 | Effect of cropping on carrying capacity | 86 |
| 5.7 | Perceived advantages and disadvantages of contracts | 88 |
| 5.8 | Possible crop replacement by malting barley | 90 |
| 5.9 | Preferred types of barley by county | 92 |
| 5.10 | Production of barley by variety by county, 1976-1977 | 92 |
| 5.11 | Attitude towards growing malting barley on a permanent basis | 93 |
| 5.12 | Attitudes towards costs and risks incurred in growing malting barley | 94 |
| 5.13 | Increased costs and risks associated with growing malting barley | 95 |
| 5.14 | Anticipated area of malting barley | 95 |
| 5.15 | Schedule prices of transporting bulk barley to Marton | 97 |
| 6.1 | Use of contractors by farmers intending to grow malting barley | 106 |

LIST OF FIGURES

| Figure | | Page |
|--------|---|------|
| 1.1 | Daily response of completed returns | 13 |
| 2.1 | Study area | 18 |
| 2.2 | Soil map of the Manawatu district | 22 |
| 3.1 | Adoption and diffusion of agricultural factors | 41 |
| 3.2 | Classification of adopters on the basis of the relative time of adoption of innovations | 42 |
| 3.3 | Summary of factors influencing adoption and diffusion | 45 |
| 4.1 | Simplified model applied to a threefold zonation of dairying around a market | 64 |
| 4.2 | Von Thunen - a simplified model | 64 |
| 4.3 | Von Thunen - the spatial expression of the basic model and three variants | 64 |
| 4.4 | Decision making on the farm | 73 |
| 5.1 | Model of farm systems | 75 |
| 5.2 | Nested hierarchy of systems | 78 |