AERU

Agribusiness and Economics Research Unit

A Lincoln University Research Centre.
New Zealand's specialist land-based university.

50 Years of the AERU

An examination and summary of past research

Tim Driver
Glen Greer

Research Report No. 328
September 2012

Lincoln University
Te Whare Wānaka o Aoraki
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Research to improve decisions and outcomes in agribusiness, resource, environmental, and social issues.

The Agribusiness and Economics Research Unit (AERU) operates from Lincoln University providing research expertise for a wide range of organisations. AERU research focuses on agribusiness, resource, environment, and social issues.

Founded as the Agricultural Economics Research Unit in 1962 the AERU has evolved to become an independent, major source of business and economic research expertise.

The Agribusiness and Economics Research Unit (AERU) has four main areas of focus. These areas are trade and environment; economic development; non-market valuation, and social research.

Research clients include Government Departments, both within New Zealand and from other countries, international agencies, New Zealand companies and organisations, individuals and farmers.

MISSION
To exercise leadership in research for sustainable well-being

VISION
The AERU is a cheerful and vibrant workplace where senior and emerging researchers are working together to produce and deliver new knowledge that promotes sustainable well-being

AIMS
- To be recognised by our peers and end-users as research leaders for sustainable well-being
- To mentor emerging researchers and provide advanced education to postgraduate students
- To maintain strong networks to guide AERU research efforts and to help disseminate its research findings
- To contribute to the University's financial targets as agreed in the AERU business model

DISCLAIMER

A summary of AERU Research Reports, beginning with #235, are available at the AERU website www.lincoln.ac.nz/aeru

Printed copies of AERU Research Reports are available from the Secretary.

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Foreword

Lincoln College was founded in 1878 as a School of Agriculture associated with Canterbury College (now the University of Canterbury and governed by the Board of Canterbury College. In 1896 the College was renamed Canterbury Agricultural College, established its own governing body, and offered the first agricultural degree course in Australasia. Degrees were to be conferred by The University of New Zealand. The college became a constituent College of the University of Canterbury, and was formally renamed Lincoln College in 1961, and was granted full university status in 1990.

The AERU (Agricultural Economics Research Unit) was one of the first agricultural economics consultancy and research organisations in New Zealand, and was established at Lincoln College in August 1962. During the half a century of its existence there have been many changes in structure, in strategic direction, and in staff. In 1987 the name of the Unit was changed to the Agribusiness and Economics Research Unit to reflect the changing emphasis of its research.

This history of the AERU documents an important chapter in the history of New Zealand economic policy research and, more recently, rural sociological research. The emphasis of AERU research has varied over time, reflecting the interests of those who have directed and worked in the organisation. Well known members of staff have included Bryan Philpott (Professor of Economics at Lincoln College, and Victoria University, a co-founder of Berl Economics, Fellow of the Royal Society), Sir James Stewart (Principal of Lincoln College and an influential figure in farm management in New Zealand,) and Bruce Ross (First Vice Chancellor of Lincoln University, Distinguished Fellow of the New Zealand Association of Economists), to name but a few.

The AERU is now a highly successful and respected provider of applied economic and sociological research in New Zealand, and has well-established international networks. This paper documents and celebrates the history of the Unit, and the steps taken to ensure its place in the New Zealand economic landscape.

During the past fifty years the AERU has published its research in series of Research Reports, Discussion Papers, Market Research Reports and Technical Papers, which are discussed in this report. In addition, AERU staff members have produced hundreds of journal articles, conference papers, client reports, and other reports not intended for public release.

The author would like to acknowledge the helpfulness and enthusiasm of those interviewed as part of this project, and of the many others who have offered advice, encouragement and assistance. The author would also like to acknowledge the assistance provided by the staff of the George Forbes Memorial Library at Lincoln University.

Abstract

The AERU at Lincoln University celebrates its 50th jubilee in August 2012. The fortunes of the AERU have fluctuated during the last fifty years, but it has continued to fulfil the role for which it was established; to research issues of importance to New Zealand's agricultural sector and to the national economy. Research themes have reflected the interests and expertise of the Unit's ten Directors and of the many staff members, associates and visitors who have contributed to its research achievements. Today the AERU undertakes a diverse range of economic, market and sociological research for an equally diverse range of New Zealand and international clients. This chronicle describes the influences on AERU research, the nature of its research, and the people who have been involved with AERU research during the last fifty years.

Chapter 1
Introduction

The Agricultural Economics Research Unit (as the AERU was known originally) was established in August, 1962. Based at Lincoln College, which had just been formally constituted as a college of the University of Canterbury and renamed (formerly Canterbury Agricultural College), the AERU was funded primarily by a £5,000 grant from Department of Scientific and Industrial Research (DSIR). Other significant contributions to the establishment of the Unit included a £1,500 annual grant from The Wool Research Organization (intended to fund a research project on wool marketing), a £700 grant from the Forest Research Institute for research into land use in forests and agriculture, as well as a two-year grant of £2,000 from the Nuffield Foundation to fund a full-time research assistant.

Cabinet approval for the establishment of the AERU was announced by the Minister in Charge of Scientific and Industrial Research, the Hon W.B. Tennent, on August 4th, 1962. In his press statement, Tennent said that "The difficulties being experienced in the sale of [New Zealand's] farm products overseas have emphasised the need for more research in agricultural economics. More detailed information is required to estimate the effects of the changes likely to be brought about by changes in overseas markets and other factors." At the same time, it was announced that the Unit would be directed by Professor Bryan Philpott, who had been appointed by Lincoln College in 1959 to the first New Zealand Chair in Agricultural Economics.

At that time it was believed that the key to the provision of higher living standards for New Zealand's rising population was increasing export revenues. Agriculture was responsible for the generation of over 80 percent of exports by value at the time, and it was estimated that, with the advances in science that had already occurred, very large increases in agricultural production were possible. However, it was recognised that an expanded economic research programme would be required to provide a basis for export policy decisions if the potential benefits of agricultural expansion were to be achieved. The AERU was established to provide that research underpinning. According to Bryan Philpott's paper, AERU Research Report No. 2, *The New Agricultural Economics Research Unit*, "The Unit aims to answer a whole range of questions which can be summarized in the question: 'What are the economic problems of a faster rate of growth of agricultural production?'" He defined three main areas of focus including market economics, production economics and agricultural industry relationships.

The first AERU report, Research Report No. 1 (1962), *The Systematic Evaluation of Development Projects*, by Senior Lecturer in Agricultural Economics Dr J. T. (John) Ward, outlined the research and publication intentions of the Unit in a short preface: "The unit has on hand a long term programme in the fields of agricultural marketing and agricultural production, resource economics and the relationship between agriculture and the general economy. The results of these research studies will be published as Unit reports from time to time as projects are completed. In addition, it is intended to produce other bulletins which may range from discussion papers outlining proposed studies to reprints of papers published or delivered elsewhere, with a view to bringing the topics discussed before a wider public."

This history has been written to review the research undertaken by the AERU during the past fifty years. It is presented in chronological order, and divided into sections based on the directorship of the Unit. This approach has been taken to demonstrate the importance of the

interests of individual directors to the research emphasis of the Unit during their tenures. The ten Directors of the AERU have been largely responsible for the direction and ethos of the AERU during its half century of existence.

Chapter 2
AERU Research

2.1 Bryan Philpott and the early years of AERU (1962-1971)

The driving force behind the establishment of the AERU was Bryan P. Philpott (M.A.; M.Com, Victoria University) (1921-2000) who became the Unit's first director. Philpott was also the first Professor and Head of the Department of Agricultural Economics at Lincoln College (and in New Zealand). At this time, agricultural economics was a relatively new field, and Philpott believed that the Chair in Agricultural Economics was regarded by many as an "ornamental position". Economics, he felt, was considered to be less important than "real" agricultural sciences. However, his dynamic and varied decade of ground-breaking and innovative research and teaching at Lincoln College clearly showed what the study of economics could contribute to farming, and he established the AERU as a reputable research unit capable of producing valuable research and attracting funds. Philpott was significant influence on the field of agricultural economics in New Zealand, and it was largely as a result of his work that econometrics and operations research were recognised as valuable tools for examining supply and demand relationships in world markets for agricultural products.

Philpott was a sought-after and widely-appreciated author, speaker and broadcaster, whose straight-talking approach was delivered in a voice described by a colleague as "…being that of a foghorn!" His ability to forecast market prospects and answer questions about the national economy meant he was regularly featured in major publications, and his presentations at events such as Lincoln College field days were eagerly awaited by attendees. Peter Nuthall, a colleague, recalls that the high attendance at Philpott's lectures often made it difficult to close the doors of the lecture hall.

It was initially feared that it would be difficult to engage suitable staff during the establishment of the AERU because of the relative youth of the agricultural economics discipline in New Zealand. A press article of the time, entitled "Work of Research Unit at Lincoln", recorded Philpott as saying "The initial grant was unlikely to provide for more than two research officers or one senior research officer and two junior research officers, together with technicians. The sort of people required would be those with training in economics... a combination of training in economics, mathematics and statistics. Universities have begun to produce people with this sort of training only in recent years and [these are] in short supply all over the world." However, this was not the case and the AERU was well-staffed and equipped in those early days. Many prominent figures in agricultural research, policy and education began, or advanced, their careers in the Unit during its early years.

Bryan Philpott was joined in 1962 by Research Economists Robin Court, Alan Frampton and Robert Townsley, all of whom were to occupy professorial chairs in other New Zealand universities in future years. Research Assistants included Mary Matheson (later Woods) and Edwin Parkes. In 1965 Robin Johnson, a prolific researcher and author who became one of New Zealand's most respected agricultural economists, joined the AERU as a Research Economist and was promoted to Senior Research Economist in 1967. Neil Taylor (later CEO of Meat New Zealand) joined the unit as Research Assistant in 1964 and subsequently became a lecturer in the Department of Farm Management, and G.C. Scott was appointed as a Research Assistant in 1965.

1967 saw a significant expansion in the AERU staff with the appointment of Research Economists Bruce Ross (later Professor of Agricultural Economics and first Vice Chancellor

of Lincoln University), T.W. Francis and Kel Sanderson (later a director of Berl Economics) and the promotion of Mary Matheson to Research Economist. Denis Hussey, David Edwards, Don McClatchy, H.J. Plunkett, Anthony Lewis and Graham Kitson were employed as Research Assistants. Research Economists Robin Court, Alan Frampton and Edwin Parkes left the Unit at that time. In 1969, the staff were joined by Research Economists Anton Meister (later Professor of Resource and Environmental Economics at Massey University), G.W. Lill and T. R. O'Malley. In addition, the AERU under Philpott provided a publishing platform for a number of staff from other Lincoln College departments, postgraduate students and authors from other organisations.

The AERU was established primarily to examine the potential impacts of increasing the output of New Zealand's agricultural industry and several key reports on this subject, written by Philpott, were published during this era. These included Research Report No. 2 (1963), *The New Agricultural Economics Unit*, which outlined the purpose and structure of the Unit, and the nature of research work to be undertaken. In Research Report No. 5 (1963), *Economic Implications for Increased Agricultural Production,* Philpott described a number of the implications of his research in this area. Of particular importance was the conclusion that, in order to meet the Government's target of an annual increase of four percent in agricultural production, an increase of £40-£50 million per annum would be required in the annual investment in agriculture by Government. An annual increase in the agricultural labour force of between 1,000 and 2,000 workers would also be required. Philpott also questioned whether a four percent annual increase in agricultural production was an appropriate policy objective. He concluded that increases of this magnitude would be likely to lead to a shift in the distribution of national income from salaries and wages to land, and to the creation of an insecure national economy with "all its eggs in one basket". He also expressed doubt about the feasibility of increasing export sales of agricultural products by four percent per year. He argued that, while the potential increase in export sales of some products, such as wool, was greater than four percent, for others, such as dairy products, increases of only one or two percent were likely to be sustainable. After publication of this report Philpott was frequently asked to speak the implications of improved productivity in New Zealand agriculture, and he often featured in the media as an author and as the subject of articles by others (e.g. Farm Production Could Improve, The Press 1963).

Above: Bryan Philpott, c. 1971.
Source: Lincoln University Photo Archive.

Philpott's research was highly regarded, and prominent agriculturalists frequently looked to him to predict trends and provide other key information on New Zealand's agricultural industry issues. At this time, wool and sheepmeats were highly sought-after internationally and comprised over 90 per cent of agriculture's share of New Zealand exports. It was this that led the Wool Research Organisation of New Zealand to provide an annual grant of

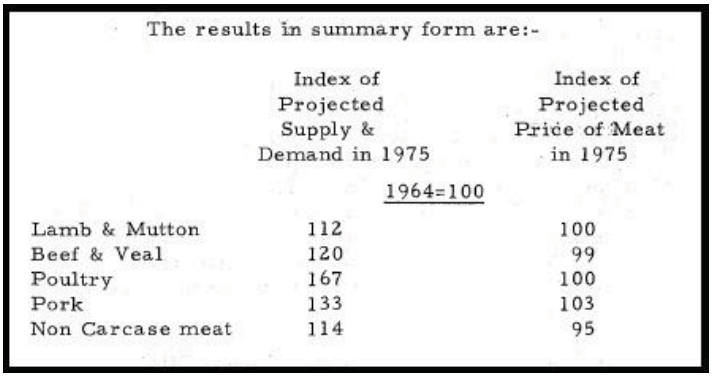
£1,500 to assist with the establishment of the Unit and fund research on wool markets and marketing.

Philpott published several significant reports on the sheep industry. In Research Report No. 8 (1964), *Economic Implications of Increased Wool Production*, he discussed the implications of increasing wool production, and concluded that it would be possible to increase New Zealand's wool production by five percent per year without affecting international wool prices, provided the expansion of synthetic textile production did not exceed ten percent per year. As world demand for mutton was increasing, and the stability of the United Kingdom lamb market restricted the opportunity for increases in lamb production, Philpott recommended that New Zealand rely less on increasing lamb production and more on export growth in wool and mutton. In Research Report No. 11 (1965), *Factors Affecting Demand for Wool Textiles in New Zealand* he reported that although "the greatest possible freedom for world trade of wool and wool textiles", was required to ensure the health of the world wool market and the competitiveness of woollen textiles with those based on synthetics, the New Zealand wool textile industry required some protection to if it was to compete with imported textiles in the domestic market. He considered that, as an exporting country, New Zealand's arguments for freedom of trade were weakened by its own trade restrictive practices, and recommended the replacement of import controls with moderate tariffs that would encourage concentration of the New Zealand textile industry on products in which they were competitive with imports, without undue distortion of production.

Other examples of Philpott's research into the New Zealand wool industry included Research Report No. 13 (1965), *Fluctuations in Wool Prices 1870-1963*, in which he described an econometric study of movements in wool prices since 1970 that demonstrated the impacts of real wool prices on the profitability of wool production in New Zealand. Research Report No. 18 (1965), *Trends in Production, Trade and Consumption of Wool & Wool Textiles*, described in qualitative terms the disposition of wool produced by the major producing and consuming countries in the post-war period. The statistical analysis in presented Research Report No. 42 (1967), *Statistics of Production, Trade Flows and Consumption of Wool & Wool-Type Textiles* was subsequently updated in Research Report No. 55 (1969), *The Structure and Wool & Wool Textile Production, Trade and Consumption, 1948-1968*, and in Discussion Paper No. 16 (1970), *The Structure of Wool and Wool Textile Production, Trade and Consumption*, by Philpott and W.G. (Guy) Scott.

Bryan Philpott was also a prolific commentator on the markets for other primary sector exports. Research Report No. 23 (1965), *An Analysis of the Retail Demand for Meat in the United Kingdom,* co-written with Research Economist Mary Matheson, provided found that a degree of substitution occurred between different types of meat in response to price changes in the United Kingdom meat market. Demand in that market was further explored in a second Philpott and Matheson Research Report No. 31 (1967), *The Regional Pattern of the Demand for Meat in the United Kingdom*. Their analysis examined regional differences in demand for meat, especially for lamb and mutton, and beef and veal in the UK market. They concluded that there was a lower preference for lamb "as one moves further north from London" and that the converse was true of the demand for beef. The differences in the price and income elasticities of demand exhibited a similar pattern. Future prospects for New Zealand meat in the UK market were explored in Research Report No. 57 (1969), *Supply and Demand Projections of the United Kingdom Meat Market in* 1975. In this report Philpott forecast United Kingdom meat prices during the following five years, which had been based on current knowledge about the structure of the meat market, and the factors influencing it.

While the results shown in the table taken from that report and shown below may look commonplace today, this was a very early example of the use of econometrics in New Zealand.



The results in summary form are:-

	Index of Projected Supply & Demand in 1975	Index of Projected Price of Meat in 1975
	1964=100	
Lamb & Mutton	112	100
Beef & Veal	120	99
Poultry	167	100
Pork	133	103
Non Carcase meat	114	95

Results of Research Report No. 57 – *Supply and Demand Projections of the United Kingdom Meat Market in 1975 (D.R. Edwards and B.P. Philpott)*

Research Report No. 25 (1965), *Strategic and Tactical Planning in International Marketing Policies*, reprinted papers from a Conference on Marketing, held in July 1965 at the University of Canterbury, which outlined comprehensive plans for the future marketing of New Zealand products, and emphasising the role of research in the field of marketing management. A paper given by Philpott to the Wellington Branch of the Economic Society of Australia and New Zealand in March 1964 was published as Research Report No. 29 (1966), *Aspects of Productivity and Economic Growth in New Zealand 1926*-1964. (1967). *Research Report No. 30 (1967) Estimates of Farm Income and Productivity in New Zealand, 1921-1965* presented updated estimates on agricultural income and productivity in New Zealand. This was the first time that the complete set of data had been published as an AERU report, although Philpott and Stewart had prepared the original estimates in 1957 and 1958. The paper described trends in productivity over the period from 1926 to 1964 and tracked the progress of economic growth in New Zealand. These estimates were updated in Research Report No. 59, (1969), *Productivity and Income of New Zealand Agriculture 1921-1967,* by Philpott and Denis Hussey.

A report that drew widespread interest from industry participants and commentators addressed the ability of the manufacturing industry to increase its capacity in future. Research Report No. 36 (1966), *Productivity, Planning and the Price Mechanism in New Zealand Manufacturing Industry*, the text of an address given to the Annual Meeting of Canterbury Manufacturers' Association in August 1966, was written from the perspective of "an agricultural economist looks at the manufacturing industry". Philpott described the rates of productivity growth in New Zealand industries during the previous decade, and the factors affecting growth rates. He also examined the requirements for, and potential sources of, growth in the decade to come and outlined a process for planning the economic growth of manufacturing in New Zealand.

Philpott's published output during the period also included eight AERU Discussion Papers. Discussion Paper No. 5, 1968, *The Shape of the New Zealand Economy in 1980*, co-written by Philpott and Bruce Ross for presentation at the 1968 Residential Conference of the New Zealand Association of Economists, was the first in a series of reports with the general theme of "New Zealand in 1980". It presented predictions of potential rates of economic growth and income in the New Zealand economy, which had been based on the results of AERU work in this area. Discussion Paper No. 8 (1969), *Price Formation in the Raw Wool Market*, co-written with C.J. MacKenzie (later Secretary of The Treasury) and Mary Woods (nee

Matheson), described an econometric analysis of raw wool price formation at auction. Discussion Paper No. 10 (1969), *Regional Economic Development in the Context of the Changing New Zealand Economy*, was a collection of papers presented at a Seminar on the Development of the Nelson Region in April 1969; which examined major trends and changes in the New Zealand economy and the Nelson regional economy; the broad implications of national trends for the Nelson Region; and a potential regional development policy. Discussion Paper No. 12 (1969), *Indicative Economic Planning with a Sixteen Sector Projection Model of the New Zealand Economy*, was a paper co-written with Bruce Ross and presented to the 41st Congress of the Australia and New Zealand Association for the Advancement of Science (A.N.Z.A.A.S.) in Adelaide, Australia in 1969. The paper described an exercise in indicative economic planning carried out in New Zealand from mid-1968, in response to the slackening rate of agricultural progress in New Zealand during the early 1960s and the inadequate returns that New Zealand received from exports during the 1966/67 period.

In Discussion Paper No. 15 (1970), *Demand Prospects for Beef*, contributed to New Zealand Institute of Agricultural Science Symposium ("New Zealand Beef Production, Processing and Marketing") in Hamilton, August 1970, Philpott discussed projections of world demand for beef in 1975. Philpott and T.R. O'Malley continued the theme of earlier Research Reports with the theme *Studies and Structure of the New Zealand Economy* in Discussion Paper No. 19 (1970) *A Pilot Optimisation Model for the 1972/73 N.D.C. Plan*.

In 1965 Bryan Philpott and Professor of Farm Management J.D. (Jim) Stewart played an important role in the organisation of the New Zealand Agricultural Development Conference, and Philpott's work was used as a major input to the conference. His work was also a key input into the Proceedings of the National Development Conference of 1968.

During the Philpott era a number of papers by Jim Stewart on approaches to effective farm management were published as AERU reports. These were highly regarded, particularly in Canterbury, and Stewart was an influential figure in New Zealand farm management circles. In Research Report No. 6 (1964), *Profitability of Irrigation in Mid Canterbury,* Stewart and D.A.R. Haslam identified several This paper, initially presented at the 14th Lincoln College Farmers' Conference in May 1964, was widely referenced as an essential resource for those managing of irrigated farming systems at the time. A follow-up article entitled "Study of Profitability in Irrigation", with notes by Stewart was published in many national newspapers. Research Report No. 7 (1964), *Programming a Canterbury Mixed Farm*, written jointly by Jim Stewart and Peter Nuthall (then a Lecturer in Farm Management), presented the results of an analysis of alternative cropping and livestock systems on a Canterbury Plains' arable farm, which showed that if an intensive wheat-white clover rotation were possible, significant increases in farm profitability could be achieved.

Stewart was also the Chairman of the Christchurch branch of the Economic Society of Australia and New Zealand, of which Bryan Philpott and other AERU associates were prominent members.

J.T. (John) Ward, Senior Lecturer in Agricultural Economics at Lincoln College, was involved in a number of AERU projects as well as using the Unit as a publication platform for his own work, particularly in the area of resource economics (related to land development for agriculture and forestry).

Ward, who had come to Lincoln after having lectured in agricultural economics at Wye College, University of London, was the author of the first AERU Research Report (No. 1, 1962), *The Systematic Evaluation of Development Projects.* This paper, which had originally

been presented to the Conference of the New Zealand Association of Economists in 1964, outlined new analytical techniques for the evaluation of land development programmes. These were described as being of use not only to economists, but to government and business officials involved in making "important decisions in the field of investment and project development". In Research Report No. 9 (1964), *Investment Analysis for Farm Improvement*, Ward described the application of those techniques in agriculture and concluded that a modified form of "discounted cash flow" was the most appropriate form of analysis for farm improvement programmes. Such techniques are routinely used today.

Ward's other publications in this field included Research Report No. 22 (1965), *The Economic Approach to Resource Development in New Zealand*, which proposed that a blueprint for resource development should be set out in an indicative, rather than a coercive, growth plan, and that individual projects proposed for inclusion in the overall plan should be assessed on a systematic and objective basis (possibly through consultation with a Project Evaluation Unit). Ward and Research Assistant Edwin Parkes compared land-use issues in agriculture and forestry, and described the use of a case-study approach to examine the relative profitability of farming and forestry developments in the Maraeti area of the Taupo-Rotorua area in Research Report No. 27 (1965), *An Economic Analysis of Large-Scale Land Development for Agriculture and Forestry.*

Ward had a strong interest in approaches to improving the profitability of agricultural industries. An example of this work was described in Research Report No. 3 (1963), *Indicative Planning for the Poultry Industry in New Zealand*. In this he concluded that a development plan was needed for the New Zealand Poultry Industry; identified other research needed to improve industry forecasting; and presented tentative projections for the poultry industry for 1973. Ward left Lincoln in 1966 to take up the Foundation Chair in Economics at the newly-established University of Waikato in Hamilton.

Alan Frampton (later Professor of Agricultural Economics and Farm Management at Massey University) was a member of the early AERU team for a short time, during which he produced two Research Reports. In the first, Research Report No. 4 (1964), *The International Sugar Situation and New Zealand's Sugar Policy*, he examined the potential returns to capital associated with a proposal to grow and process sugar beet in New Zealand. His analysis indicated that New Zealand would be better to continue to purchase raw sugar at the world price, than to attempt to establish a domestic sugar industry. If the Government was convinced that a domestic sugar industry was an important development, Frampton recommended that a Sugar Beet Investigation Unit should be established to evaluate all aspects of the proposal thoroughly. In the second, Research Report No. 16 (1965), *A Market Target for the New Zealand Dairy Industry*, Frampton described the methodology used to develop market projections and provided supply and demand estimates for New Zealand dairy exports. He concluded that the proposed annual growth rate of four percent in the volume of dairy exports could be sold profitably during the next decade.

Robert (Bob) Townsley (later Professor of Operations Research at Massey University) joined the AERU after spending 18 months as a farm advisory officer with the Department of Agriculture in Auckland. During his time in the AERU he was the author of four Research Reports. Research Report No. 17 (1964), *A Note on Breeding Flock Composition in Relation to Economic Criteria* (Australian Journal of Agricultural Economics), reported a comparison of the profitability of a range of flock composition and culling practices, and described the implications of these for farmers. In Research Report No. 15 (1965), *The Problem of Scheduling Sales of New Zealand Butter on the United Kingdom Market* Townsley discussed the problems associated with programming monthly deliveries of butter to the United Kingdom from New Zealand, an important issue since the United Kingdom Market provided

much of New Zealand's foreign exchange at this time. He suggested the use of Dynamic Programming to facilitate the scheduling process. Research Report No. 21 (1964), *The Maximisation of Revenue from New Zealand Sales of Butter on the United Kingdom* (first published in the Australian Journal of Agricultural Economics) also dealt with this subject. Research Report No. 28 (1966), co-written by Townsley and Robin Johnson, *A Review of the Argentine Beef Cattle Situation*, reviewed the patterns of export beef production in Argentina, a major export competitor of the New Zealand beef industry. This analysis was updated by Johnson in Discussion Paper No. 7 (1968), *Recent Trends in the Argentine Beef Cattle Situation*.

Robin Johnson was the author of many reports during his time in the AERU. In Research Report No. 40 (1967), *High Country Development on Molesworth,* he described an investigation of the potential development of Molesworth Station in the South Island for beef production, but recommended that the economic impacts of various alternative options would require far more detailed investigation. Other hill country development analysis was reported in Research Report No. 47 (1967), *The Impact of Falling Prices on Taranaki Hill-Country Development*, in which the profitability and output of 15 farm development programmes was compared. Research Report No. 54 (1969), *Fertiliser Use in Southland*, was the last of a series of three AERU reports on fertiliser use (including Research Reports 44 and 46 authored by R.C. (Rodney) Jensen and A.C. Lewis). In this report the use of fertilisers, particularly superphosphate, in Southland was examined in relation to the pattern of agricultural production in the region, and the factors that would affect future demand were identified. The analysis had differentiated between the intensification of existing farming systems, and the development of new farmland. In Research Report No. 62 (1970), *An Economic Analysis of Soil Conservation and Land Retirement on South Island High Country*, Johnson examined the economics of land retirement as a means of improving soil conservation in the higher altitude tussock grasslands of the South Island of New Zealand. He concluded that, as the benefits of soil conservation accrued to society rather than to the runholder, conservation plans that included land retirement should include subsidies for developments that would improve the carrying capacity of the land remaining in production. The results of a Spatial Linear Programming analysis of New Zealand sheep and beef farms were reported in Research Report No. 63 (1970), *A Regional Analysis of Future Sheep Production in New Zealand*. The research found that sheep and beef enterprises were likely to be strictly competitive on New Zealand farms, so changes in prices could be expected to result in marked alterations in the output mix.

Johnson was also the author of AERU five discussion papers during the Philpott era that included Discussion Paper No. 1 (1967), *A Review of Evaluation Studies in New Zealand Agriculture and Forestry*, a paper presented to the New Zealand Seminar on Project Evaluation in Agriculture and Related Fields at Lincoln College in November 1967. In this, Johnson set out some of the main developments in project evaluation in agriculture and forestry in New Zealand, from 1955 to 1967. Discussion Paper No. 6 (1968), *Economic Problems of New Zealand Agriculture*, first presented at the 40th Congress of A.N.Z.A.A.S. in Christchurch, 1968, concluded that while New Zealand urgently required higher foreign exchange inflows, reliance on agriculture, which accounted for 91 percent of export revenues at the time, to generate these was risky and that policies to encourage other export industries were required. A paper contributed to the New Zealand Institute of Agricultural Science Symposium ("New Zealand Beef Production, Processing and Marketing") in Hamilton, August 1970 was published as Discussion Paper No. 14 (1970), *The Future Profitability of Beef Production in New Zealand*. In this, Johnson explains the expected production responses, and associated profitability implications, of the New Zealand sheep and beef industries to differences in the relative world prices of sheep and beef products. In

Discussion Paper No. 17 (1970), *Trends in the Terms of Exchange and Productivity in the New Zealand Dairy Industry*, an analysis of data on price trends affecting the dairy industry since 1948/49 was presented, and estimates of productivity increases over the period discussed.

In addition to his research and discussion papers, Johnson also wrote one technical paper, Technical Paper No. 4 (1968), *Trends in Rural Land Prices in New Zealand, 1954-1969,* in which he reviewed information from official records on a representative series of rural land market values for the period 1954 to 1969, and discussed the economic changes in the aggregate rural land market over this time.

In Research Report No. 37, *Some Projections of Retail Consumption in New Zealand*, projections of retail consumption, derived using a demand forecasting methodology, developed by R.H. (Robin) Court were presented. He explained this methodology for estimating demand relationships for groups of commodities in Technical Paper No. 1, *An Application of Demand Theory in Projecting New Zealand Retail Consumption*.

Research Report No. 20 (1965), *The Use of Linear Programming in Least-Cost Feed Compounding,* was written by Neil W. Taylor, an AERU Research Assistant, who discussed the use of Linear Programming, a popular analytical method of the time, in determining least-cost feed formulations for broiler chickens. He concluded that the use of computers and linear programming for least-cost feed formulation would enable producers to reduce feed costs markedly in the near future.

Some members of the staff of the Departments of Agricultural Economics and Farm Management were formally associated with the AERU during its early years. In the first half of the Philpott era these included A.T.G. (Alastair) McArthur, Senior Lecturer in Rural Education. Like Ward, McArthur was involved in some AERU projects as well as using the Unit as a publication vehicle for his own work, which dealt largely with planning as a component of farm management. An analysis of a development strategy recommended by the Department of Agriculture that involved fencing, fertiliser application and stocking was the subject of Research Report No. 10 (1965), *Profitability of a Recommended Strategy for Development on Two Banks Peninsula Farms.* The results of this showed that the programme was profitable at both the national and individual farm levels. McArthur also wrote Technical Paper No. 13 (1970), *The Effect of Taxation Method on Post-Tax Income Variability*, in which he analysed the effects of several income tax assessment methods on the year-to-year variation in the post-tax income of the self-employed, including farmers.

The AERU projects in which McArthur was involved included examination of the use of computers in farm budgeting (Research Report No. 45 (1967), *Computer Methods for Farm Development Budgets,* co-written with K.T. (Kel) Sanderson). McArthur was a strong advocate for the use of computers in farm budgeting and promoted their use in the farming media as well as in research outputs. He reported that his "experience with the IBM 1620 computer (at University of Canterbury) for research purposes has suggested its possible use in extension and advisory work". An image of that computer, in use by former AERU staff members Mary Matheson and M.W. Calder, is shown below. In fact, it was largely as a result of the extensive use of this computer by AERU staff and associates, that the Lincoln College Council approved the purchase of an IBM 1130 computer in 1965.

Above Left: AERU staff members Mary Matheson and M.W. Calder feeding data-cards into the University of Canterbury's IBM 1620 computer.
Source: Lincoln University Calendar, 1963

Above Right: The IBM 1130, purchased in 1965 after extensive use of University of Canterbury's computer by AERU associates.

Source: Lincoln University Calendar, 1965

Reports written by other staff members from the Department of Agricultural Economics Department staff and published by the AERU include P. Hampton's (Lecturer in Economics) Research Report No. 12 (1965), *The Degree of Protection Accorded to New Zealand Manufacturing Industry by Import Licensing*. In this report Hampton examined the dual problems of calculating the appropriate level of protection for New Zealand manufacturing industries, and determining the form that it should take. He estimated the approximate magnitude of the price differentials that existed between imported and locally produced commodities in three sectors of the New Zealand economy. J.W.B. Guise's, a Lecturer in Economics, was the author of Research Report No. 19 (1965), *Standardisation of Farm Accounts for Managerial Analysis*, in which an 8-point agenda for farm accounts management was proposed. This was an early contribution to a debate on accounts standardisation that continues today. Guise also produced Technical Paper No. 5 (1969), *The Effect of Weather and Technological Change on New Zealand Crop Yields: An Econometric Analysis*, in which he presented an approach to including variables such as climate, technical change, and other factors affecting agricultural productivity in the econometric models of wheat yields used, for example, in estimating the value of wheat research. A summary of this paper was also published in the American Journal of Agricultural Economics.

Two reports written by G.A.G. Frengley (Gerald), a Lecturer in Farm Management, were published by the AERU during the Philpott era. The first, Research Report No. 35 (1966), *Programming Farm Development*, co-written by Frengley, R.H.M. (Rodney) Tonkin (Field Officer) and Robin Johnson, was intended as an extension tool. They used two comparative case studies to evaluate alternative methods of development against economic and management criteria. The second, Research Report No. 39 (1967), *Index to New Zealand Agricultural Publications 1964 – Index to New Zealand Periodicals*, an index of the agricultural literature available in 1964, was written to assist "extension workers, and others interested in agriculture, in maintaining contact with more than a small proportion of the agricultural data published each year."

J.S. Holden, a farm advisory officer (Economics) with the Department of Agriculture, published several reports on issues affecting hill country development under the AERU banner. A significant study into the profitability of hill country development, conducted in conjunction with the Meat and Wool Board's Economic Service, was published as a series of two reports entitled *The Profitability of Hill Country Development*. Research Report No. 14

(1965), *Part 1: Analytical Methods*, and Research Report No. 24 (1965), *Part 2: Case History Results,* were based on 16 case studies designed to answer questions on the profitability of development, impediments to increasing production from hill country, and the institutional changes required to facilitate development. The study found that approximately 75 per cent of development programmes had made a significant contribution to national welfare, but only half of the farmers involved in the study were better off as a result of development. The report, which was regarded as a valuable tool for those evaluating hill-country developments, attracted considerable press attention. In Research Report No. 33 (1966), *The Economics of Hill Country Development*, reprinted from the *Proceedings of the New Zealand Grassland Association (pp. 64-74)*, Holden evaluated the profitability of a number of development options, and discussed the many factors that had affected profitability. He emphasised the importance of evaluating the economic impact of each step in the development programme.

The second half of the Philpott era saw the publication of a series of reports describing a major aspect of the Unit's work at the time. This work involved the development of inter-industry models of the New Zealand economy that were used to examine the future role of agriculture in the New Zealand economy, by evaluating the impacts of differing assumptions of agricultural sector growth on projections of the state of the economy in 1975. The series, entitled "Studies in the Structural Development of the New Zealand Economy", was written by Bryan Philpott, Bruce Ross and T.W. Francis. Series Paper No. 1, Research Report No. 41 (1968), *Input-Output Models for Projecting and Planning the Economy* (Philpott and Ross) described the methodology adopted and the steps involved in model development. Series Paper No. 2, Research Report No. 49 (1968*), Inter-Industry Structure of the New Zealand Economy 1961-5*, presented estimates of a "sixteen sector inter-industry table of the economy for each of the years 1961-1965, and examined the inter-relationship of different sectors and their effect on the New Zealand economy. Series Paper No. 3, written by T.W. Francis, Research Report No. 52 (1968), *Sectoral Capital Formation in New Zealand 1958-1965,* described the origin and disposition of capital formation from 1958 to 1965 by sector. This work was based on the results of preliminary research by Francis in early 1967. In Technical Paper No. 6 (1968), *Capital Formation in New Zealand Manufacturing Industries 1910 to 1964*, also based on this work, Francis provided estimates of the capital stock employed in the manufacturing industry of New Zealand between 1910 and 1964, and included detailed discussion of methods used and adjustments required. A later, but related, report, Research Report No. 65, *Capital Formation in New Zealand Agriculture 1946-67,* by Robin Johnson, which was the final report to be published during the Philpott era, presented new estimates of capital formation for a large part of the agricultural sector for the period since World War II.

A.C. Lewis (AERU Research Assistant, later Lecturer in Economics) and R.C. Jensen, (Lecturer in Economics) jointly produced Research Report No. 44 (1967), *Fertiliser and Production on a Sample of Intensive Sheep Farms in Southland 1953-64,* which was part of a series of AERU reports examining the economics of fertiliser use in New Zealand farming. It Research Report No. 44, the results of a comparative study of intensive lamb production in Southland, based on farm records over a ten year period were reported. The study showed that stocking rates had increased by nearly 20 per cent over the period without the use of higher fertiliser inputs. Research Report No. 46 (1967), *Budgeting Further Development on Intensive Sheep-Farms in Southland,* a follow-up report, dealt with the problems faced by farmers considering further intensification, and demonstrated that at the prevailing product prices, further development would have positive returns even for systems that were already relatively intensive.

Lewis was also responsible for two AERU Discussion Papers. Discussion Paper No. 9 (1969), *Agricultural Production Functions,* a paper presented to the New Zealand Association of Economists in February 1969, examined the concept of the production function; its relation to the theory of supply and demand; and its use as a tool for economic analysis; and reviewed some associated measurement problems in an agricultural context. Discussion Paper No. 18 (1970), *Marketing Margins for New Zealand Lamb and for All Lamb and Mutton in the United Kingdom,* co-written by S.M.C. Murray, showed that there were significant differences in the pricing behaviour of different supermarkets in the United Kingdom, which reflected the move by supermarkets towards fixed and growing margins over wholesale market prices. These had traditionally fluctuated more widely than retail prices. Technical Paper No. 9 (1970), *Estimation of Farm Production Functions Combining Time-Series and Cross-Section Data,* which was related to Discussion Paper No. 9, described a combined cross-sectional and time-series analysis of production functions, with application to a sample of intensive fat lamb farms in New Zealand.

H.J. Plunkett was involved in several AERU projects at the time. The unabridged version of his thesis was published as Technical Paper No. 14 (1970), *Land Development by Government 1945-69.* In this paper, Plunkett described his analysis of all the completed long-term agricultural development projects undertaken by the Department of Lands and Survey since the end of World War II and assessed their profitability and internal rates of return in 1969 values.

Graham Kitson published one Research Report during this era. Research Report No. 50 (1968), *Fresh Fruit and Vegetable Retailing in New Zealand – An Economic Survey*, in which he summarised the results of a study funded by the New Zealand Fruitgrowers' Federation. This research had involved a survey of New Zealand fruit and vegetable retailers to obtain data on a number of general issues related to fruit and vegetable retailing, and particularly on the size of marketing margins, the costs of retailing, and the differences in costs between different types of outlets. Technical Paper No 12 (1970) reported in the results of the survey in detail, explained the methodology used in the analysis, and discussed technical issue related to this.

Two Research Reports by Don McClatchy described a two-part investigation of tower silo farming in New Zealand, examining the advantages and disadvantages of the use of tower silos for storage of conserved feed, with or without mechanical feeding systems and indoor housing. The first part, Research Report No. 56 (1969), *Tower Silo Farming in New Zealand: Part 1 – A Review,* described the extent to which tower silos were used in New Zealand and reviewed their potential advantages and disadvantages. In the second, Research Report No. 58 (1969), *Tower Silo Farming in New Zealand: Part 2 – Economic Possibilities*, the costs and benefits of tower silos under three farming scenarios were evaluated. In his third and final AERU report, Research Report No. 60 (1969), *Current Trends in New Zealand Beef Production and Disposal,* McClatchy reviewed trends in cattle numbers, sources of beef production and exports, beef prices and market outlets, and examined the implications for the meat industry of increasing levels of export beef production.

In Technical Paper No. 10 (1970), *An Econometric Study of the North American Lamb Market*, D.R. Edwards outlined the technical and institutional framework of the North American lamb market; described an econometric analysis of the factors which influenced consumption and prices of lamb; and presented estimates of the income and price elasticities of demand for lamb in the markets of the United States and Canada.

Staff from other Lincoln College departments continued to publish their work as AERU reports. J.L. Morris (Assistant Lecturer in Farm Management), and R.G. Cant (Relieving

Lecturer in Rural Education), co-wrote Research Report No. 38 (1967), *The Nature and Extent of the Farm Labour Shortage in Cheviot County, Christchurch,* in which they described the results of a survey on the adequacy of the farm labour force in Cheviot County. The object of the work was to establish whether a shortage existed and, if so, to examine its nature, extent and causes, and suggest potential policy solutions. Morris, H.J. Plunkett, and Robin Johnson examined trends in livestock numbers in Cheviot County in relation to the targets that had been set at the 1964 Agricultural Development Conference, in Research Report No. 51 (1968), *Livestock Targets in North Canterbury Hill Country: The Impact of Changing Prices*.

Cant, in collaboration with Research Economist Mary Woods, was also author of Technical Paper No. 2 (1968), *An Analysis of Factors Which Cause Job-Satisfaction or Dissatisfaction among Farm Workers in New Zealand,* in which the authors investigated job-satisfaction as an indicator of farm success. The evidence suggested that poor personal employee/employer relationships are a significant contributor high labour turnover, and have led to depletion of the farm labour force.

Rodney Jensen (Lecturer in Farm Management) was responsible for several reports on the subject of project evaluation that were published by the AERU. He edited Research Report No. 48 (1968), *(Proceedings of a New Zealand Seminar on) Project Evaluation in Agriculture and Related Fields*, which included papers by Bryan Philpott, J.D. Stewart, J.T. Ward, Jensen, and many other AERU staff members and associated staff. Discussion Paper No. 2 (1968), *The Economic Evaluation of Investment in Large-Scale Projects – An Essay to Recommend Procedures*, based on discussions held at the same seminar, was intended to provide a series of series of uncomplicated recommendations for undertaking project evaluation at the "grass-roots" level, rather to contribute to the academic debate on the application of discounted cash-flow techniques. Discussion Paper No. 3 (1968), *Economic Evaluation of Water Resources Development,* a paper originally presented at the 40th Congress of A.N.Z.A.A.S in Christchurch, outlined the theoretical basis for resource allocation, as well as techniques for the economic evaluation of water resources developments. These techniques were employed in the study described by Discussion Paper No. 4 (1968), co-written by A.C. Norton (a Classifier with the North Canterbury Catchment Board), *An Illustrative Example of Evaluation Procedures (Drainage Scheme – North Canterbury).* This was an amended version of a paper presented to a training course sponsored by the New Zealand Association of Soil Conservators at Lincoln College, May 1968, in which the authors examined a drainage scheme proposed for North Canterbury.

In Research Report No. 43, *A Survey of Christchurch Consumer Attitudes to Meat*, C.A. (Chris) Yandle, (Assistant Lecturer in Economics) examined the characteristics of the Christchurch market for meat exploring consumer responses to price and income changes and reporting derived "income coefficients", which showed the rate at which demand would increase in response to increases in income. The more technical aspects of the analysis of these data were discussed in Technical Paper No. 3 (1968), *The Theory and Estimation of Engel Curves: Some Estimates for Meat in New Zealand.* Yandle also produced Discussion Paper No. 11 (1968), *Quarterly Estimates of New Zealand Meat Price, Consumption and Allied Data, 1946-1965* and Technical Paper No. 7 (1968), *An Econometric Model of the New Zealand Meat Market*, continuing the theme of market research in the AERU, by describing an econometric model developed to estimate some of the basic parameters underlying the formation of domestic meat prices and the determination of the consumption of meat in New Zealand.

B.N. (Bruce) Hamilton and Robin Johnson conducted a survey of the growing costs of process peas that was commissioned by the New Zealand Vegetable and Produce Growers'

Federation (Inc.), the results of which were reported in Research Report No. 53 (1968), *Processing Peas: A Survey of Growers' Return 1967-68,* since it was considered to be of wide interest in farming circles. The economics of land development, a subject extensively researched by the AERU, was the subject of Research Report No. 61 (1969), *Land Development by the State: An Economic Analysis of the Hindon Block, Otago*, an economic analysis of the development of Hindon Station in Otago by the State, following its purchase in 1961. This work was based on the M.Agr. Sci. thesis of former AERU staff member, Edwin Parkes, who concluded that economic analysis of the optimal size and type of settlement unit, and method of development, would be of benefit to Heads of Departments and field officers contemplating such developments in future. R.G. (Richard) Pilling (Lecturer in Farm Management) was the author of Discussion Paper No. 13 (1969), *Recent Developments in the Meat Industry with Particular Reference to Otago and Southland,* a paper presented to the Otago Branch of the NZ Economic Society in October 1969, in which he discussed recent trends in the meat industry.

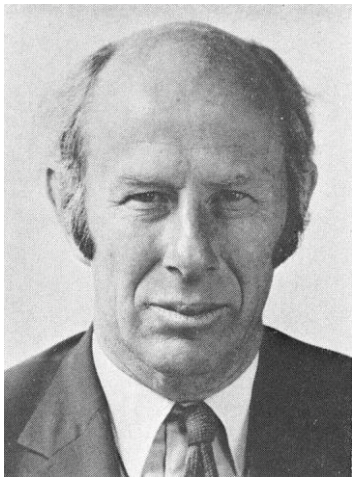
K.Y. Ho's masterate thesis was published posthumously as Research Report No. 64 (1970), *An Economic Assessment of the Middle Class and Upper Middle Class Market in Malaysia as a Potential Outlet for NZ Meat and Dairy Products*, after Ho was killed in the Malaysian riots of May 1969. Ho examined the Malaysian market for New Zealand export food products, including consumer reactions to western foods and the impact of increasing purchasing power on these. He concluded that an immediate market was available for dairy products and mutton amongst upper income consumers, but that amongst other consumers demand for New Zealand products would be slow to develop.

In Technical Paper, No. 11 (1970), *Consumer Demand for Beef in the E.E.C.* A.C. Hannah reviewed trends in E.EC. beef markets and previous research into the demand for beef in Europe and presented the results of econometric models that he had developed for each of the five main E. E. C. nations. The report also provided information on the meat market structure in each of these countries.

During the period that Bryan Philpott was Director of the AERU, the Unit published 65 research reports, six technical papers and 20 discussion papers. The modelling and statistical work of Philpott and others, particularly in the areas of productivity and structural development is still regarded as a significant resource, and formed the basis of many of the statistical protocols employed by the Ministry of Primary Industries (formerly Ministry of Agriculture and Forestry. The Philpott era also saw the publication of a very significant body of work on capital formation in the New Zealand agricultural sector and the wider New Zealand economy. A number of publications dealt with aspects of the export and domestic markets for the outputs of New Zealand's agricultural industries and the implications for New Zealand producers of predicted market trends. AERU staff members were also at the forefront of research and extension work in the evaluation of agricultural development projects, at a time when development and intensification was a major focus of the farming sector.

2.2 Stewart, McCarthy and Dent (1971-1980)

2.2.1 James Stewart: 1971-1974



Above: James Stewart, c. 1974.

Source: Lincoln University Photo Archive.

Bryan Philpott's departure from the AERU in 1971, to take up the McCarthy Chair of Economics at Victoria University of Wellington was a significant loss to Lincoln College. Professor of Farm Management, James (Jim) Stewart, assumed the position of Director of the AERU, which he held until 1974. Stewart had worked closely with the Unit since 1964, and had published several AERU reports and papers. Not unlike Philpott, Stewart received a great deal of press attention and his reports and presentations were frequently reported the national and farming papers. He frequently featured as a speaker at farmer field days.

A number of staffing changes occurred within a year of Philpott's departure, and AERU staff numbers were reduced markedly. Although Robin Johnson had been appointed to the position of Assistant Director in 1971, he was shortly to leave for New South Wales, returning at the end of that year to take up a position as Deputy Director of the newly formed Economics Division of the Ministry of Agriculture. By late 1971, the AERU's full-time staff had fallen to three – Research Economists Graham Kitson, D.J. Shepherd and C.R. Higham, and by 1972 only Graham Kitson remained on the full-time staff. He was joined by A.W. Smith in 1973. Lincoln staff from other departments who were formally associated with the AERU during these years included Bruce Ross, Alastair McArthur, Richard Pilling, L.D. (Les) Woods, Anton Meister, future Director of the Unit W.O. (Owen) McCarthy, J.W. (John) Wood, J.L. (John) Rodgers and J.R. (Joan) Rodgers.

The AERU published three Research Reports and five Discussion Papers under Stewart's directorship. H.J. Plunkett continued his work in the field of project evaluation, publishing Research Report No. 68 (1972), *An Analysis of Lands and Survey Development Projects 1945-69*, which examined the levels of effective subsidy in the post-war farm creation programme. T.R. O'Malley's final AERU publication was another contribution to the body of AERU research on inter-industry relationships. In Research Report No. 67 (1973), *The Optimisation of a Sixteen Sector Model of the New Zealand, he* described the formulation of a linear programming model of the New Zealand economy. Technical aspects of this model were was described in Technical Papers 15 and 16. In Research Report No. 66 (1971) *Distribution Costs and Efficiency for Fresh Fruit and Vegetables,* Graham Kitson examined the retail distribution costs in the fruit and vegetable industry from het welfare and efficiency viewpoints. This was an abbreviated version of his thesis, which had been published in its entirety as Technical Paper no 12 in 1970.

Discussion Paper No. 20 (1971), *Recent Trends in Capital Formation in New Zealand Agriculture, 1964-69,* written by Robin Johnson and S.M. Hadfield, was a short statistical account of capital stock statistics in New Zealand between 1964 and 1969. Hadfield also revised the data presented in Research Report No. 59 (1969) *Productivity and Income of New Zealand Agriculture 1921-67* in Discussion Paper No. 21 (1971) of the same title.

During this period it had been suggested by some members of the scientific fraternity that New Zealand should move away from traditional ryegrass/white clover pastures towards

more extensive use of nitrogenous fertilisers, in conjunction with the adoption of continuous cropping and storage of maize and annual winter ryegrass. In response, Bryan Philpott, I.D. Greig, and A. Wright co-wrote Discussion Paper No. 22 (1972), *Some Aspects of the Economics of Nitrogen Storage Farming in New Zealand* to examine the economic implications of this proposal. They concluded that the returns to the capital required for harvesting and storage under the proposed regime would be higher than under conventional grazing systems, but that research may alter relative costs in future. An extensive producer survey and evaluation of prevailing stone fruit prices formed the basis for A.W. Smith's Discussion Paper No. 23 (1971), *Economic Aspects of Stone Fruit Marketing in New Zealand*. Discussion Paper No. 24 (1972), *New Zealand, The Ten and Future Market Strategies,* Owen McCarthy's first work with the AERU, was first published as an article in the Canterbury Chamber of Commerce Economic Bulletin No. 559 in April 1972. It outlined key characteristics of the ten largest economies in the world, and identified potential strategies to ensure that New Zealand's stake in international markets was maintained. McCarthy concluded that "overall, future market prospects are as good as we want to make them. There are no poor markets, only poor marketers".

Three Technical Papers were published under Stewart's leadership. O'Malley's work on inter-sectoral relationships in the New Zealand was the subject of Technical Papers 15 and 16. Greater technical detail on the development of the model was described in Technical Paper No. 16 (1972), *A Linear Programming Model for Economic Planning in New Zealand*, while in Technical Paper No. 15 (1971), *The Application of Linear Programming to Problems of National Economic Policy in New Zealand,* the use of the model to answer address national policy issues was described. The conclusions drawn from this work were that, since the expansion of markets for manufactured exports would be difficult, New Zealand must maintain its level of investment in farming in order to maintain its standard of living; that economic growth depended more on the development of new products and industries than on expansion of traditional ones; that immigration policy should focus on the encouragement of workers skilled in the areas of primary product exports; and that, while import substitution should not the major policy priority, some encouragement of import substitution was required to ease the balance of payments.

The final Technical Paper to be published by the AERU, Technical Paper No. 17 (1972), *The Optimal Use by Farmers of the Income Equalisation Scheme* by A.T.G. McArthur, reported the use of a dynamic programming analysis of the Income Equalisation Scheme to determine optimal strategies for use of the Scheme under conditions of fluctuating farm incomes.

A new series of reports, Market Research Reports, was initiated in 1972, around the time that Owen McCarthy first introduced marketing into the teaching programme at Lincoln College. Six reports in this series were published during the Stewart era. The first included a two-part series entitled *Processing Plant Location Studies,* written by Owen McCarthy, J.L. Rodgers and C.R. Higham. Market Research Report No. 1 (1972), *Processing Plant Location Studies: I: Theory and a Simple Application to New Zealand Wool Selling Centres,* discussed the theoretical basis for a "workable" methodology for solving plant location problems, with reference to some empirical examples. Market Research Report No. 2 (1972), *Processing Plant Location Studies: II: Policy Alternatives for New Zealand Wool Selling Centres*, included further methodological explanation, particularly with reference to "forcing" extensions of standard solutions, and discussed the application of this approach to the determination of the optimal location of New Zealand wool selling centres. The authors reported a pressing need for further research in this area, specifically in the use of econometric models to forecast future wool production and demand; the incorporation of wool scouring operations into the model; the investigation of wharf handling operations; and

the identification wool types in terms of regional production and final destination.

The proceedings of a seminar held at Lincoln College in November 1972, to examine the Japanese market for exports, edited by McCarthy, was published as Market Research Report No. 3 (1972), *Doing Business in Japan,* while in Market Research Report No. 4 (1973), *The Japanese Distribution System and Implications for New Zealand Traders*, Graham Kitson presented an analysis of Japan as a potential trading partner. Kitson described the principal characteristics of the Japanese distribution system and some changes expected in future, and suggested appropriate entry strategies for New Zealand traders. Kitson's interest in the Japanese market also led to the publication of Market Research Report No. 5 (1973), *Prospects and Strategies in Promoting Tourism between Japan and New Zealand*, an analysis of the tourism market and the opportunities for increasing inter-country tourist flows between Japan and New Zealand. McCarthy edited Market Research Report No. 6 (1973), *Market Assessment,* the proceedings of a seminar at Lincoln College in August 1973, at which participants examined approaches to, techniques for, and theory related to market assessment. A number of AERU associates including A.T.G. McArthur, J.R. Rodgers, Bruce Ross and McCarthy presented papers at the seminar.

During the Stewart years the AERU continued its research into inter-sectoral relationships, and aspects of land development and the intensification of production. The emphasis on market research increased under the influence of Owen McCarthy, and locational studies were included in the research agenda.

2.2.2 Owen McCarthy, 1974-1977

In 1974, James Stewart stepped from his roles as Director of the AERU and Professor of Farm Management, to become the Principal of Lincoln College, and (William) Owen McCarthy, Professor of Marketing was appointed as Director. McCarthy brought considerable expertise in market research and trade analysis to the AERU. Peter Chudleigh was appointed as Deputy Director and Graham Kitson became the Senior Research Economist. T.I. (Tim) Ambler, R.J. (Russell) Gillespie and J.D. (Janet) Gough, Research Economists, completed the staff at this time. Bruce Ross, Les Woods, and John Wood were no longer included on the list of Department staff formally associated with the AERU, although they continued to publish in AERU series, but R.J.(Rod) Brodie, newly appointed Lecturer in Marketing, began his long association with the AERU at this time.

Above: Owen McCarthy, 1971.

Source: Personal collection.

1974 was a year of structural change in the Unit. The AERU Policy Committee, chaired by Own McCarthy (Marketing), and including Professor J.B. (Barry) Dent (Farm Management and Rural Valuation), Professor Bruce Ross (Agricultural Policy) and Dr Peter Chudleigh, was established to determine the overall research direction of the Unit.

In 1975, J.G. (John) Pryde accepted the position of Research Fellow in Agricultural Policy, Janet Gough resigned, and Russell G. Moffitt and Keith B. Woodford (later Professor of Farm Management) were appointed as Temporary Research Economists. The staff remained unchanged throughout 1976.

The AERU published eight Research Reports and twelve Discussion Papers during

McCarthy's directorship. The first, Joan Rodger's Research Report No. 69 (1974), *Quantitative Techniques for Forecasting*, described the use of econometric techniques, particularly the Box-Jenkins technique, to predict wool prices for the 1974 season. Research Report No. 71 (1975), co-written by Owen McCarthy, Russell Moffitt, P.W. (Peter) Cosgriff and Peter Chudleigh, *Studies in Costs of Production: Process Peas and Beans, 1974-75*, reported the use of survey and other data in an analysis of production costs of process peas and beans, and the crop management implications of the results of the analysis.

Locational studies, the first of which had been completed by McCarthy et. al. in 1972, were included in the research agenda during throughout McCarthy era. Three reports were completed including Research Report No. 72 (1975), co-written by Joan Rodgers, Owen McCarthy and Vicki Mabin, *Location of Farm Advisory Officers in New Zealand: An Application of Facility Location Analysis*, which used an established methodology to determine the optimal placement of farm advisory officers in New Zealand. The authors concluded that, while current placements were not all optimal, low cost solutions were available. Although un-related to primary production, the issue of optimising the location of ambulance facilities was addressed by Janet Gough and Owen McCarthy in Research Report No. 73 (1975), *The Ambulance Facility Location Problem – A Survey of Methods and a Simple Solution.* Although the subject was outside the usual scope of AERU work, it was undertaken because McCarthy recognised that widening the scope of AERU research in the primary industries would require the use of a wider range of quantitative techniques, including the development of dynamic equilibrium models and stochastic models of supply and demand. The ambulance problem provided a suitable vehicle for developing this expertise because a considerable body of work had been published on this topic, and the empirical data required were readily obtainable from New Zealand sources. Market Research Report No. 7 (1974), written McCarthy and Brodie, *Optimum Size, Number and Location of Freezing Works in the South Island, New Zealand – A Spatial Analysis,* examined the cost and efficiency implications of optimising the location of freezing works in New Zealand. The analysis showed that, in the South Island, greatest efficiencies could be achieved with fewer, larger, more-centralised plants.

The AERU's work on the costs of production in agricultural enterprises continued with a commission from NZ Milk Board and the NZ Town Milk Producers' Federation to undertake an annual cost and income survey of town milk producers to provide information on the returns to labour on New Zealand town milk supply farms. This was the first of several on-going series of surveys that provided the AERU with stable sources of funding that made possible the employment of undergraduate assistants and research assistants. R.J. Gillespie was responsible for this work which was contracted for an initial period of three years. A series of reports, collectively entitled *Studies in Costs of Production: Town Milk Supply Farms*, began with Research Report No. 74 (1976), *Studies in Costs of Production: Town Milk Supply Farms 1973-7,* and was repeated in each of the two following years. A Visiting Lecturer in Farm Management from Reading University, P.J. Charlton, published Research Report No. 70 (1975), *A Practical Guide to Tax Planning Using Procedures for Income Equalisation*. McCarthy described this as part of "a modest programme" of AERU research into the assessment of the taxation schemes available to farmers, which had been undertaken to address the marked lack of information available elsewhere. Charlton carried out a cost benefit analysis of four such schemes under several scenarios.

The first of the Discussion Papers produced during this time was McCarthy's Discussion Paper No. 25 (1974), *The Wool Acquisition Controversy,* which addressed an issue that had divided the wool industry at the time - the proposed reform of wool marketing by setting up a statutory authority that would compulsorily acquire and market all New Zealand wool. This

paper was also published as Canterbury Chamber of Commerce Economic Bulletin, No. 577, March 197. McCarthy concluded that while, in his view, "a single authority participating in and exercising control in selling, handling and transport and engaging in market research is necessary", the great New Zealand wool acquisition debate would drag on for some time as the wool industry continued to teeter on its "antiquated…foundation".

Bruce Ross was prolific author of Discussion Papers during this time. His publications included Discussion Paper No. 26 (1974), *Productivity,* (Canterbury Chamber of Commerce Economic Bulletin, No. 580, June 1974), in which Ross discussed a range of productivity measures and some problems associated with their application in New Zealand. Discussion Paper No. 27 (1974), *Investment on the Rural Scene*, (a paper presented to The New Zealand Institute of Valuers Seminar at Massey University in May 1974) explained the nature of, and motivation for, rural investment and the main influences on investment decisions. The implications of the oil crisis for international economies, and strategies for minimising the risks and mitigating the effects of oil depletion were the subject of Discussion Paper No. 28 (1974), *The Oil Crisis and International Economic Stability.*

Rural transport was a focus of research by Tim Ambler, whose work was published as Discussion Papers No. 30 and 31. In Discussion Paper No. 30 (1975), *Use Made of Transport by Farmers: A Pilot Survey with Findings Relating to Ashburton County New Zealand,* Ambler described the seasonal patterns associated with the transport of agricultural commodities to and from farms in Ashburton County, and demonstrated that postal surveys were a cost-effective means of obtaining the accurate data required for transport studies. In Discussion Paper No. 35 (1976), *Rate Regulation and Economic Efficiency in Rural Road Goods Transport,* he examined the New Zealand Ministry of Transport's justification for setting the rate minima and maxima for the rural road goods-transport industry, in light of the continuing need for greater efficiency in the farm servicing industries. Ambler concluded that minimum rate controls should be removed, that rates charged should more closely reflect cost differences, and that controls over entry to the industry should be relaxed.

John Pryde undertook a survey of farmer opinions and attitudes that was a forerunner to a series that would later to become a widely reported annual event in the AERU calendar. Discussion Paper No. 31 (1975), *A Postal Sample Survey of Sheep Farmer Attitudes to Incentives and Obstacles to Increasing Farm Output, and Other Agricultural Policy Issues,* examined farmers' ability and willingness to increase production during the 1975-76 season, and their attitudes towards a range of incentives and obstacles to increased production. A similar survey of farm advisors, reported in Discussion Paper No. 33 (1976), *A Postal Survey of the Opinions of a Group of Farm Management Society Members on Incentives and Obstacles to Increasing Farm Output*, found some significant differences in the relative rankings of incentives and obstacles between farmers and their advisors. Discussion Paper No. 32 (1976), *Proceedings of a Seminar on Costs Beyond the Farm Gate, Held at Lincoln College, 12 March 1976*, was edited by Pryde, McCarthy and D.L. Fyfe, and included papers on approaches to containing the escalation in off-farm costs during the period. The *Proceedings of a Seminar on Wool Marketing in the 1980s, Held at Lincoln College, 21 October 1976,* published as Discussion Paper No. 36 (1976), were also edited by Pryde and McCarthy.

Foreshadowing an issue of the greatest importance in modern-day Christchurch, John Wood discussed the goals and aspirations of Christchurch residents for the development of their city in future, including the impact of the city on the broader Canterbury region, and the desired objectives and form of regional policy in Discussion Paper No. 29 (1975), *Christchurch Tomorrow: A Discussion of the Future Development of Christchurch as a Regional Centre*. Discussion Paper No. 34, co-written by Peter Chudleigh and Steve J. Filan (on academic

leave from University of New South Wales), *A Statistical Analysis of Sources of Variance of Income on Sheep Farms in New Zealand*, reported the results of the first of Chudleigh's studies of the New Zealand wool industry. A variance-partitioning technique was used to measure the relative contribution of several factors to variation in sheep farm incomes, which showed that the variability of wool prices had been the dominant factor affecting the variability of farm incomes for average farms at both regional and national levels. Discussion Paper No. 37 (1976), *Some Economic Aspects of Conference and Non-Conference Wool Shipping*, described Chudleigh's comparison of hypothetical freight rates for a specialised wool service with then current Conference rates for wool shipping. Chudleigh recommended future research into the cross-subsidy effects between freight rates to facilitate the more rational formulation of Government policies on protection/subsidisation; the service, delivery and other requirements of European wool importers; and the impacts of the withdrawal of wool freight on the overall efficiency of the Conference service and on freight rates for other commodities.

Three Market Research Reports were published during McCarthy's directorship. The first, Report No. 7, is described above. The others described Graham Kitson's continuing on Japanese markets for New Zealand exports. Market Research Report No. 8 (1975), *The Japanese Food Market and Implications for New Zealand*, described the Japanese market for food products, and the potential role of New Zealand in supplying it. Kitson concluded that despite current difficulties, long-term prospects for continued rapid growth of the Japanese economy were good. Market Research Report No. 9 (1976), *Structure and Corporate Relationships in the Japanese Wool and Wool Textile Industries*, was to be the last in the Market Report series. Prepared for the benefit of New Zealand wool exporters , it described the structure and inter-relationships of the Japanese wool and wool textile industries, and emphasised the need for New Zealand wool exporters to be aware of their own strengths in their relationships with Japanese companies. Subsequent reports on market issues were published as Research Reports.

Under McCarthy the AERU's emphasis on market research continued and the range of research undertaken increased to include locational and transport studies, and a more extensive use of quantitative techniques. The first of several series of on-going surveys of farmers were published during this time. Discussion papers covered the diverse range of research interests of the staff now employed by, or associated, with the Unit.

2.2.3 Barry Dent, 1977-1981

In 1977, when McCarthy left Lincoln College to take up a position at the North Brisbane College of Advanced Education, J.B. (Barry) Dent, Professor of Farm Management and Rural Valuation, became the new Director of the Unit. His own research interests were in farm business management, modelling farmer decision-making, development of national farm policy support models, and regional development.

Above: Barry Dent,
Date unknown.

Source: Lincoln University Photo Archive.

The Dent era saw considerable expansion of the AERU staff. Peter Chudleigh remained as Deputy Director, and the Unit Policy Committee now comprised Dent (Farm Management and Rural Valuation), Chudleigh (AERU) and Bruce Ross (Department of Economics and Marketing). Tim Ambler resigned and John Pryde and Graham Kitson were joined by

Research Economists W.A.N. (Nick) Brown, L.E. (Lance) Davey and G.T. Oborne. Several Post-Graduate fellows were appointed including L.J. (Lionel) Hubbard, R.D. (Rod) Inness, A.M.M. (Andy) Thompson and H.T. Wickramaskera. The Unit Secretary was J.V. Boyd, and S.A. Lines was employed as Analyst/Programmer. Under Dent's directorship (1977-1980), the AERU's research output returned to the level of the Philpott era with the publication of 32 Research Reports and 31 Discussion Papers. Dent described the AERU at this time as having an "atmosphere... of some excitement and enthusiasm".

It was during this era that Research Fellow John Pryde obtained permission from the College Council to establish a leadership programme for future farm leaders. This was named the Kellogg Rural Leadership Programme after Pryde had secured funding for the first five years of the programme from the US Kellogg Foundation. In 1979, Pryde organized and ran the first of ten annual leadership programmes with the aim of developing leadership skills, and an understanding of the impacts of political, cultural, social, economic, and physical forces on New Zealand agribusiness, amongst course participants. Many well-known figures in New Zealand public life attended the Kellogg courses, including former Prime Minister Jenny Shipley who credited the Kellogg Course with "igniting her interest in New Zealand politics". The programme was widely advertised in major newspapers and the farming press, and applications exceeded the number of places available by a considerable margin. The Kellogg Rural Leadership Course remains a feature of the Lincoln University annual calendar today. Pryde was also responsible for organising a series of well-attended annual "budget night meetings", held immediately after the year's Budget had been delivered by the Minister of Finance, to discuss the implications of the Budget for the agricultural sector.

In 1978 Nick Brown was promoted to Senior Research Economist and Research Economists Roger D. Lough, Sandra K. Martin and S.L. Young were appointed. The ranks of Research Economists increased again in 1979 with the appointment of G.T. (Geoff) Harris, Russell Moffitt, Lionel Hubbard, M.M. (Mike) Rich, R.L. (Ron) Sheppard, A.M.M. (Andy) Thompson. R.M. MacLean was appointed as a Technical Officer, H.J. Freese as Secretary, and L.J. Wilson as a Post Graduate Fellow. During 1980, the final year of Dent's directorship, Ken Leathers joined the Unit as Senior Research Economist, R.L. (Russell) King was appointed as a Research Economist, and Nicola Blyth and N.M. (Nicola) Shadbolt (later Professor of Agricultural Management at Massey University) arrived from England to take up Post Graduate Fellowships. Two undergraduate fellows, S.A. Chisholm and L.J. (Lester) Foulds were appointed, and Vicky Mathieson became Secretary. The new staff appointments during this period made an extension of AERU research into new areas including natural resource management and regional development.

An important development in 1980 was the inclusion of post-graduate supervision as part of the roles of senior AERU staff members, who co-supervised the research of a number of masters and PhD students in the Department of Agricultural Economics and the Department of Farm Management and Rural Valuation. This responsibility has continued to the present day.

The acquisition of on-going research funding from several external organisations during this time provided valuable stability for the AERU. It enabled the unit to offer employment to a range of staff with expertise in diverse areas and broaden the basis of AERU research. The extended range of publications this made possible strengthened the AERU's reputation as a reliable source of information and research provider to the New Zealand primary sector, and considerable efforts were made to secure contracts from a wide range of research clients.

Rod Brodie was primarily responsible for a series of *Consumer Surveys,* carried out by marketing staff and final-year marketing students from the Department of Economics and

Marketing. These surveys were conducted to collect information on consumer demand for, and attitudes to, a range of food products and beverages amongst random samples of Christchurch consumers. The first of these, Research Report No. 79 (1977), written by R.J. Brodie and M.J. (Michael) Mellon, *Wine: A Consumer Survey of Christchurch Households,* examined the patterns of consumer purchase and consumption of wine, and the implications of these for the wine industry. Other papers in this series included: Research Report No. 82 (1977), *Meat: A Consumer Survey of Christchurch Households* (R.J. Brodie); Research Report No. 91 (1978), *Bread: A Consumer Survey of Christchurch Households* (R.J Brodie and M.J. Mellon); Research Report No. 102 (1979), *Cheese: A Consumer Survey of Christchurch Households* (R.J. Brodie and M.J. Mellon); Research Report No. 105 (1980), *Potatoes: A Consumer Survey of Christchurch Households*; and Research Report No. 111 (1980), *Fish: A Consumer Survey of Christchurch Households* (R.J. Brodie).

A significant series of studies commissioned by Federated Farmers of New Zealand Inc. from 1977 involved surveying arable farmers annually to obtain statistical information on aspects of wheat production. Several authors were involved in producing a series of reports which included: Research Report No. 84 (1977), *National Wheatgrowers' Survey No. 1 1976-77,* By R.G. Moffitt and L.E. Davey; Research Report No. 92 (1978), *An Economic Survey of New Zealand Wheatgrowers, Survey No. 2, 1977-78*, co-written by R.D. Lough, L.E. Davey, S.A. Lines, R.M. MacLean and R.G. Moffitt; Research Report No. 101 (1979), *An Economic Survey of New Zealand Wheatgrowers, Survey No. 3, 1978-79*, authored by Roger Lough, R.M. MacLean, Patrick McCartin and M.M. Rich; Research Report No. 113 (1980), *An Economic Survey of New Zealand Wheatgrowers: Enterprise Analysis Survey No. 4, 1979-80*; and Research Report No. 116 (1980), *An Economic Survey of New Zealand Wheatgrowers: Financial Analysis, 1978-79*. The series continued after Dent's departure in 1981.

In 1977, John Pryde conducted the first in a series of *Farmer Opinion Surveys.* This series, jointly commissioned by I.C.I. Tasman Vaccine Ltd, Ivon Watkins-Dow Ltd, Merck Sharp and Dohme (New Zealand) Ltd and Todd Motors Inc., obtained information from farmers on their intentions, expectations and opinions with respect to a range of farming and other issues. Research Report No. 81 (1977), *Survey of New Zealand Farmer Intentions, Expectations and Opinions, April-May 1977* was soon followed by Research Report No. 96 (1978), *Survey of New Zealand Famer Intentions, Expectations and Opinions, June-August 1978 and* Research Report No. 106 (1980), *Survey of New Zealand Farmer Intentions and Opinions, July – September 1979.*

The *Town Milk Survey* commissioned by the New Zealand Milk Board and the Town Milk Producers' Federation of New Zealand (Inc.), continued to provide information on the costs and returns of town milk supply enterprises. The reports of this work include Research Report No. 93 (1978), *An Economic Survey of New Zealand Town Milk Producers, 1976-77*, authored by Moffitt, Davey and M. (Marv) Pangborn; Research Report No. 98 (1979), *An Economic Survey of New Zealand Town Milk Producers, 1977-78*; and Research Report No. 108 (1980), *An Economic Survey of New Zealand Town Milk Producers, 1978-79*; both written by Moffitt.

Two reports by Peter Chudleigh commissioned by the Ministry of Agriculture and Fisheries, examined the marketing costs of export industries. The reports emphasised the importance of supply chain analysis of exporting industries, rather than research that examined only individual elements of the supply chain, and the pressing need for research in this area. These reports included: Research Report No. 83 (1977), *Marketing Costs for New Zealand Wool: 1970/71 to 1975/76,* in which Chudleigh examined the relationship between the charges for wool marketing activities and the actual costs of these activities, and the differential impacts of charges, and changes in charges, on different sectors. Research Report

No. 94 (1978), *Marketing Costs for New Zealand Meat Exports, 1970-71 to 1975-76* (Chudleigh, L.D. Woods and M. (Mike) Clemes), described a framework for the future monitoring and analysis of meat exporting charges, and recommended that priority be given to a study of production-transport-processing interrelationships.

Other reports completed by Chudleigh during this period included Research Report No. 85 (1978), *Shipping New Zealand's Agricultural Exports: Background and Issues,* in which he discussed a number of issues associated with international sea freight from New Zealand, and concluded that returns to agricultural production and processing activities may be threatened by further increases in freight rates. Chudleigh, D. Leitch and Gerald Frengley were the authors of Discussion Paper No. 39 (1978), *A Survey of Mid Canterbury Famers' Attitudes to Growing Sugar Beet*, which reported the results of a postal survey of farmers in mid-Canterbury, undertaken to ascertain their attitudes towards sugar beet production. In Discussion Paper No. 40 (1979), written by Chudleigh, Young and Nick Brown, *New Zealand Agriculture and Oil Price Increases*, the authors discussed the implications of an oil price rise for New Zealand agriculture, and concluded that more information was required to inform decisions in this area. The effects on New Zealand exporters and importers of a proposed sea freight bill were the subject of Discussion Paper No. 49 (1980), *The Cost of Overseas Shipping: Who Pays?* Discussion Paper No. 44 (1979), *The Proceedings of a Seminar/Workshop on the New Zealand Goat Industry*, was edited by Chudleigh, R.J. Brodie and R.L. Sheppard.

Sandra Martin published a number of Research Reports on wool marketing. These included Research Report No. 97 (1979), *Peak Wool Flows through the Marketing System*, in which Martin described the New Zealand wool marketing system and examined potential cost-saving techniques for the wool industry. Report No. 100 (1979), *Recent Trends in the Argentinian Wool Industry*, comprised and analysis of recent trends in the wool industry of Argentina, traditionally one of New Zealand's major export market competitors. The study found that wool production in Argentina had been declining for several years, and Argentinian wool exports were more frequently directed into markets that were not important export markets for New Zealand wool. Martin and John Pryde also co-wrote Research Report No. 114 (1980), *A Review of the Rural Credit System in New Zealand, 1964 to 1979,* which was an extensive review of rural credit systems in New Zealand over this period.

Research Report No. 99 (1979), *The Regional Impacts of Irrigation Development in the Lower Waitaki*, (Lionel Hubbard and Nick Brown) was a widely cited in the period following its publication, when the development of community irrigation schemes was at its height. The study estimated the potential regional implications of a large-scale government-funded irrigation scheme in the Lower Waitaki Basin of the South Island, using regional input-output analysis to demonstrate both the direct and indirect impacts of the scheme on the regional and national economies.

A survey of farm managers and workers, reported in Research Report No. 115 (1980), *A Socio-Economic Study of Farm Workers and Farm Managers,* by G.T. Harris was undertaken to assess the impacts of social and economic policies associated with farm labour. Harris found that, although wages were not a major contributor to departure from the industry, higher wages or other opportunities to earn additional income would assist farm workers in achieving their goal of home ownership. Harris, and T.W. Stevenson also undertook an economic impact analysis published as Discussion Paper, Discussion Paper No. 45 (1979), *An Evaluation of the Southland Flood Relief Temporary Employment Programme.*

Other publications of the Dent era include Research Report No. 78 (1977), *Response Patterns to a Mail Survey of New Zealand Farmers*, by Tim Ambler which included a user-guide to

conducting postal surveys. A report by Nick Brown and R.G. Pearson (of the Joint Centre for Environmental Science), Research Report No. 80 (1977), *The Energy Requirement of Farming in New Zealand,* showed that New Zealand compared well with the USA, UK and Australia in an analysis of energy input to, and output from, farm production. In Research Report No. 86 (1978), *Current Cost Depreciation and the Valuation of Farm Tractors and Headers*, (the first AERU report to base analysis on information gathered from the Wheatgrowers' survey) Lance Davey compared "historical cost" accounting as a method of calculating the depreciation of farm plant and equipment with the "current cost" depreciation measurement proposed by the Richardson Report, a seminal report on reform of the New Zealand tax system. He found that "current cost" depreciation based on diminishing values resulted in "book" values that were closer to estimated actual values than depreciated historical cost estimates. Research Report No. 90 (1978), *A Transport Survey of South Island Farmers*, by S.L. Young, T.I. Ambler and Steve J. Filan, summarised volume and flow patterns of livestock and wool movements in the South Island. Research Report No. 112 (1980), *An Analysis of Alternative Wheat Pricing Schemes* was co-written by M.M. Rich and L.J. Foulds, who used a historical simulation approach to show that more direct links between domestic producer wheat prices and world prices could be expected to lead to higher producer prices and foreign exchange earnings, but that consumer prices would also be higher, price stability would probably decline, and self-sufficiency levels would not necessarily increase, since these were strongly related to meat and wool prices.

The AERU report series continued to be used as a publishing platform for College staff from other departments, and by overseas visitors. The impacts of seasonal variations in feed supply on stocking rate decisions were discussed in Research Report No. 88 (1978), *Production and Supply Relationships in the New Zealand Sheep and Beef Industries,* by Keith Woodford and Les Woods. In Research Report No. 103 (1979), *A Study of Excess Livestock Transport Costs in the South Island of New Zealand*, Rod Inness estimated that "excess transport costs" of $2,452,506, representing 24 per cent of the estimated actual costs of livestock transport. Detailed information on pesticide use in Canterbury and Southland, which had been collected by means of a farmer survey, was presented in Research Report No. 107 (1980), *A Survey of Pests and Pesticide Use in Canterbury in Southland*, by J.D. Mumford.

A.C. (Tony) Beck, a PhD student in the Department of Economics and Marketing at the time, who was to become a member of AERU staff, published Research Report No. 110, *Brucellosis Eradication: A Description of a Planning Model*. Beck, with financial support from the Australian Meat Research Committee, had formulated a simulation model as a tool to assist in planning brucellosis eradication campaigns. The model had been successfully used by veterinarians in Australia, and was expected to have wider application. Steve Harrison (on academic leave from University of Brisbane) produced Research Report No. 87 (1978), *Optimum-Seeking Designs for Simulation Experiments with Models of Agricultural Systems*, examining the validity of bio-economic models as a means of exploring the response of systems to factors that could be controlled by farm management practices. Research Report No. 89 (1978), *Computer Simulation Models of Pasture Production in Canterbury: Description and User's Manual* documented the development, validation, application methodology, and computer coding of a set of dynamic simulation models of pasture production on the Canterbury Plains of New Zealand by Garry W. Fick (on academic leave from Cornell University).

During this period a large number of discussion papers were produced. Graham Kitson's published work on Japan as a potential future trading partner, was extended by Discussion Paper No. 38 (1978), *A Comment on Fisheries and Agricultural Trade Relationships Between*

New Zealand and Japan, in which Kitson showed that New Zealand's future trade negotiations with Japan were unlikely to be as successful as they had been previously, in the light of the restriction of access by Japanese boats to New Zealand's exclusive fishing zone. Kitson's Research Report No. 95 (1978), *Interfibre Relationships and Textile Marketing in Japan* investigated the Japanese textile industry to assist New Zealand companies with an interest in this market.

Two Discussion Papers dealing with goat production were co-written by Ron Sheppard and D.K. (Deb) O'Donnell. Discussion Paper No. 42 (1979), *A Review of the New Zealand Goat Industry,* provided an overview of the goat industry in New Zealand at the time. In a commentary on the future of the industry, the authors concluded that there were substantial markets for goat products that would provide adequate returns to the New Zealand producer. Discussion Paper No. 43 (1979) *Goats: A Bibliography*, was a compilation of references on a range of goat husbandry and marketing issues. Sheppard and N.J. Beun examined Japanese Food Policy and the real self-sufficiency levels for animal feed and meat in Japan in Discussion Paper No. 47 (1979), *Japanese Food Policy and Self Sufficiency – An Analysis with Reference to Meat*, while Discussion Paper No. 50 (1980), *Market Evaluation: A Systematic Approach – Frozen Green Sprouting Broccoli*, consisted of a literature review and an examination of the size of the Christchurch market for frozen green sprouting broccoli, by means of a consumer survey. *Proceedings of a Seminar on Future Directions for New Zealand Lamb Marketing,* Discussion Paper No. 52 (1980), was edited by R.J. Brodie and R.L. Sheppard and Sheppard also produced Research Report No. 109 (1980); *Changes in United Kingdom Meat Demand.* This report emphasised the importance of a pricing strategy as part of a marketing strategy for lamb and mutton in the United Kingdom market, which was becoming more sensitive to changes in relative prices, and was experiencing an increase in demand for pork and poultry meat consumption.

Other discussion papers of this period included a paper by Mike Rich and Tony Zwart - Discussion Paper No. 46 (1979), *Economic Factors Affecting Wheat Areas Within New Zealand*, which updated a wheat-area forecasting model developed by J.W. Guise (1968). Discussion Paper No. 48 (1980), *Corporate Structure of a Beet-Ethanol Industry*, W.A.N. Brown and J.B. Dent, discussed arrangements that might facilitate close financial associations between sugar beet farmers and that would allow farmers to share the benefits of the development of a New Zealand industry. N. Blyth's Discussion Paper No. 51 (1980), *The E.E.C. Sheep-Meat Regime: Arrangements and Implications*, based on her PhD research in the AERU, described the arrangements by the E.E.C. for a common sheepmeat market, and discussed some of the issues of concern to third countries. Discussion Paper No. 41 (1979), *The Development of Rational Policies for Agricultural Trade between New Zealand and Japan: Proceedings of a Seminar Sponsored by the Japan Advisory Committee (Wellington, 12 December 1978),* was edited by Tony Zwart and L.J. Wilson and included papers by a number of AERU staff and associates.

The Dent era was characterised by considerable diversity in the areas of research undertaken by the AERU. Surveys were used extensively to acquire timeseries of information on farm returns and costs of production, as well as on farmer opinions and intensions with respect to on a range of issues. The analysis of international markets, and marketing arrangements for primary products and of New Zealand's trade relations continued, as did research into the economic aspects of primary sector transport arrangements.

2.3 Chudleigh, Lattimore and Pryde (1981 -1988)

2.3.1 Peter Chudleigh, 1981-1984

Above: Peter Chudleigh,
Date unknown.

Source: Personal collection.

In 1981, Dr Peter Chudleigh was appointed as the first full-time Director of the AERU, at which time Dent reported, that the decision to appoint a director who was not also the Head of Department at the College "… was approved partly as a result of the continuing success in gaining funding from outside sources, and partly because of the growth in the team and the quality of the work being carried out". Dent remained on the Policy Committee his departure to take up the new Chair of Agricultural Resource Management at Edinburgh University in late 1986. Chudleigh's time as Director was a productive period in the AERU's history, during which it produced 47 Research Reports and 37 Discussion Papers. Chudleigh was regarded as a dynamic Director, who secured many contracts with leading agri-business firms and government departments. According to one of his colleagues, "[the Unit] was his life – he had a good team, good rapport with all the people wanting jobs, and funds and so on. He made it happen."

In 1981, round the time of Chudleigh's appointment, the AERU staff comprised J.G. (John) Pryde, Research Fellow in Agricultural Policy; Ken Leathers and Roger Lough, Senior Research Economists; C.D. (Chris) Abbott, A.C. (Tony) Beck, J.D. (Janet) Gough, R.L. (Russell) King, R.G. (Russell) Moffitt, M.M. (Mike) Rich and R.L. (Ron) Sheppard, Research Economists; P. (Patrick) McCartin, C.R. (Chris) McLeod, Assistant Research Economists; and N. (Nicola) Blyth, C.K.G. (Chris) Darkey, M. Kagatsume, and N.M. (Nicola) Shadbolt, Post Graduate Fellows; and newly appointed Secretary, J.A. (Judy) Rennie. 1982 saw the addition of J.M. (Jeanette) Biggs, G. (Glen Greer) and M.T. (Mike) Laing as Assistant Research Economists. Both Chris McLeod and Russell King departed later that year. Peter McCrea was appointed as an Assistant Research Economist in 1982. In 1983 both Tony Beck and Ron Sheppard were promoted to Senior Research Economist positions; three new Assistant Research Economists, S.A. (Sally Anne) Hughes, G.N. (Geoff) Kerr and J.P. (John) Rathbun were appointed; and Cathy Hill replaced Judy Rennie as secretary. For 1983 and 1984, as a means of increasing D.S.I.R funding to the AERU, Glen Greer was transferred to the D.S.I.R. staff and seconded back to the AERU, undertaking a number of research evaluation projects for D.S.I.R. divisions during this period. Ken Leathers resigned during 1984, the final year of Chudleigh's directorship, but the staff continued to expand with the appointment the AERU's first Research Sociologist, J.R. (John) Fairweather, and Assistant Research Economists L.B. (Lindsay) Bain, D.E. (Diane) Fowler and S.E. Guthrie.

The governance and management structures of the AERU were revised again during 1982/1983. The AERU Advisory Committee (renamed the Review Committee in 1985), which included representatives of a number of organisations considered to be AERU stakeholders, replaced the Policy Committee which had been established to oversee the AERU research programme in 1975. The Advisory Committee (as of March 31st 1983) comprised Professor Sir James Stewart (Principal), Dr G.W. Butler (Nominee of the Director-General, DSIR), Mr B.D. Chamberlin (Nominee of the President, Federated Farmers of New Zealand (Inc.)), Mr J. Clarke (Nominee of the Chairman, New Zealand Planning Council), Professor Barry Dent (Head of the Department of Farm Management and Rural Valuation,

Lincoln College), Mr E.J. Neilson (Nominee of the College Council), Professor Bruce Ross (Head of the Department of Agricultural Economics and Marketing, Lincoln College), Mr P. Shirtcliffe (Nominee of the Advisory Committee), Mr E. Stonyer (Nominee of the Director-General, MAF), and Dr Peter Chudleigh (Director of the AERU). While there were changes in the individuals who comprised the Review Committee, its representation was unchanged during the next few years.

The appointment of Professor Bruce Ross as Principal of Lincoln College in 1985, after the retirement of Sir James Stewart, marked the end of Bruce Ross's research association with the AERU, although he continued as a member of the Advisory Committee.

The three annual farmer surveys that had started during the Dent years continued under Chudleigh's directorship. Russell Moffitt conducted four more surveys of town milk producers, covering the seasons 1979-80 to 1982-83, which were published as Research Reports 120 (1981), 129 (1982),139 (1983), and 157 (1984). The Wheatgrowers' Survey, which was by then published in two parts, an *Enterprise Analysis* and a *Financial Analysis,* were continued by Roger Lough for the year 1979-80 to 1983 and published as Research Reports 121, 122 (1981), 131,132 (1982), 142,143 (1983) and 160,161 (1984). John Pryde's *Farmer Opinion* surveys were published as Research Report No. 126 (1982), *Survey of New Zealand Farmer Intentions and Opinions, September-November 1981,* Research Report No. 136 (1983), *Survey of New Zealand Farm Intentions and Opinions, October-December 1982,* and Research Report No. 152 (1984), *Survey of New Zealand Farmer Intentions and Opinions, October-December, 1983.* These surveys provided a vehicle that was used by a diverse range of agribusiness firms and other organisations to explore issues in which they were particularly interested.

Pryde also published Research Report No. 118 (1981), *Survey of the Health of New Zealand Farmers: October-November 1980*, which reported the results of a survey of general and specific health issues affecting New Zealand farm workers, ranging from smoking and/or drinking to occupational injuries, and was funded by the Department of Health. Discussion Paper No. 82 (1984), co-written with Lindsay Bain, *The State of Agricultural Credit in New Zealand,* discussed the state of the rural credit market at the time. It showed that the Government's involvement in the farm finance market had increased during the period of gradual decline in the New Zealand economy over the previous two decades. Although farmers' equity had increased considerably over this period, the cost of finance was of major concern to them. Pryde and Bain followed this paper with Discussion Paper No. 86 (1984), *Financing New Zealand Horticulture*, which focussed on financial assistance to New Zealand horticulture, and found that lack of access to long-term finance remained an issue for the horticultural industry. Both of these received widespread press attention.

Chudleigh, while full-time Director of the AERU, and supervisor to undergraduate and postgraduate fellows at the Unit, was also involved in the publication of three Discussion Papers. Discussion Paper No. 68 (1983), co-written with Glen Greer, *Energy Use in New Zealand Agricultural Sector,* assembled data on energy use in New Zealand agricultural production over the past decade, which showed that although the use of energy intensive inputs had varied over the period, these changes did not appear to have been related to changing real fuel prices. They concluded that the impact of fuel conservation measures on the output mix of New Zealand farms, if such measures were being widely adopted, did not yet show in the data available. Discussion Paper No. 72 (1983), *Supporting the Agricultural Sector: Rationale and Policy,* co-written with Glen Greer and Ron Sheppard, presented a framework for the analysis of financial assistance from the viewpoint of efficient resource allocation. Chudleigh and A.J. Nicholson edited Discussion Paper No. 64 (1982), *Proceedings of a Seminar on Road Transport in Rural Areas*, which examined the use of road

transport associated with various land uses in New Zealand agriculture, and was funded by the National Roads Board.

Ron Sheppard was a prolific author during this period. The seven research reports he produced between 1981 and 1984 included Research Report No. 119 (1981), *Horticulture in Akaroa County*, which evaluated Banks Peninsula as a location for potential horticultural development. Research Report No. 123 (1982), *Seasonality in the New Zealand Meat Processing Industry*, reviewed the fixed/variable nature of the costs of the freezing industry, suggesting that the future for the industry was likely to involve the establishment of smaller, higher-technology plants, which would replace labour inputs with capital input, lowering fixed costs overall. Two papers co-written with M.T. Laing investigated issues associated with export of New Zealand fruit products. Research Report No. 150 (1983), *The World Market for Fruit Juice Products: Current Situation and Prospects*, was an extensive review of trends in production, consumption and trade in fruit juice products, which concluded that, while opportunities did exist on many markets for fruit juice products, the markets were extremely competitive. Research Report No. 151 (1984), *The Economics of Controlled Atmosphere Storage and Transport for Nectarines, Apples and Kiwifruit*, which had been funded by D.S.I.R., presented an economic evaluation of controlled atmosphere storage and transport for New Zealand nectarines, apples and kiwifruit.

An on-going series of reports was commissioned by the New Zealand Potato Board to increase understanding of factors influencing the success of the New Zealand potato sector, and enable participants to base decisions based on robust market information. These papers included Research Report No. 130 (1982), *The New Zealand Potato Marketing System*, which examined the marketing channels used and key features of the New Zealand potato marketing system. The authors recommended that the industry should work towards matching the supply of potatoes with demand; implement strict grading standards; and undertake promotional activity, in order to achieve higher prices and increase demand. Report No. 145 (1983), co-written with S.A. Hughes, *Potatoes: A Consumer Survey of Auckland, Wellington and Christchurch Households*, provided survey-based information on regional differences in consumer response towards potatoes, while Research Report No. 146 (1983), also co-written with S.A. Hughes, *Potatoes: Distribution and Processing*, included an analysis of potato distribution costs and processing sector requirements.

Ron Sheppard was also author, or co-author, of a number of Discussion Papers during this period. Discussion Paper No. 63 (1982), *Supplementary Minimum Prices: A Production Incentive?*, co-written with Jeanette Biggs, examined the objectives and effectiveness of the Supplementary Minimum Prices (SMP) Scheme introduced in 1978, concluding that the objectives of the Scheme were not clear and appeared to have changed over time. Even had consistent, clear objectives been established and maintained, the SMP scheme was unlikely to have been particularly effective in maintaining or increasing pastoral production. Discussion Paper No. 75 (1983), *Tomatoes and the Closer Economic Relationship with Australia,* which reviewed cost and supply data from both Australia and New Zealand, showed that the impacts of the CER agreement were "likely to have been small" on the tomato industry.

During the Chudleigh era there was an expansion of the AERU's research into the organisation of the meat industry, in response to the significant changes that had occurred in that industry during 1970s. The research was directed towards the development of a clearer understanding of the industry inter-relationships, with a particular emphasis on marketing issues. Ron Sheppard wrote several papers on this subject. Discussion Paper No. 80 (1984), co-written with Diane Fowler, *Deregulation: Impact on the Christchurch Meat Industry,* documented the changes that had occurred in the Christchurch meat industry post-deregulation, as a result of changes in economic policy. They concluded that deregulation

had the potential to increase the efficiency and competitiveness of meat processing, wholesaling and retailing. Since deregulation was a major subject of debate at the time, the paper drew considerable press attention (Canterbury Farmer, June 1984; The Press, 20/07/1984). In Discussion Paper No. 56 (1981), *The Further Processing of Meat*, Sheppard and K.M. (Kirsty) Silcock found that there was sufficient evidence to justify an increase in the proportion of further processed meat exports to many of New Zealand's major markets, at the expense of traditional carcase exports. Bruce Ross, Sheppard and Tony Zwart co-wrote Discussion Paper No. 62 (1982), *The New Zealand Meat Trade in the 1980s: A Proposal for Change*. This study of the New Zealand meat market suggested the establishment of a carcase meat market, through which the bulk of carcase meat would be required to pass, so that that all potential exporters had access to product, and that prices for meat were set in New Zealand. This would ensure that the demand for meat in different international markets would be reflected in the average prices received in the New Zealand market.

AERU staff continued to work with former colleagues who had left to establish private-sector research and consultancy companies during this period. Research Report No. 141 (1983), was co-written by Roger Lough and Nick Brown (now partner in economics consultancy firm, Brown Copeland and Co, Ltd.), *New Zealand Arable Sector: Foreign Exchange Implications*, identified the foreign exchange inputs and outputs of the New Zealand arable sector, and showed that agricultural exports still comprised 69 percent total exports, despite the increases in manufacturing exports that had occurred. Lionel Hubbard worked with Nick Brown on the creation of input-output tables for thirteen Statistical Areas for New Zealand, which were used to derive regional output, income, and employment multipliers for the individual regions, and describe approximate models of the economy in each of these regions. This research was reported in Research Report No. 117 (1981), *Multipliers from Regional Non-Survey Input-Output Tables for New Zealand*. Russell Moffitt and Graham Kitson, who was at this time working as a business consultant specialising in issues related to the Japanese market (Japan Trade Research Associates), edited Discussion Paper No. 79 (1984), *Consider Japan: Papers from a Seminar Conducted by the Japan Centre of Christchurch, 11th May 1983*. Two former Ambassadors to Japan gave papers at the seminar. Ken Leathers, B.M.H. (Basil) Sharp and Nick Brown were the authors of Report No. 135 (1983), *Water and Choice in Canterbury*, a review and assessment of research priorities for Lower Rakaia and Central Plains irrigation planning.

Leathers' other Research Reports during this time included Research Report No. 154 (1984), *The Economics of Farm Accidents and Safety in New Zealand Agriculture*, co-written by J.D. (David) Williams, with contributions from Joan Rogers and Glen Greer, in association with ACC, which estimated the potential costs of farm accidents in New Zealand. Research Report No. 162 (1984), *Farmland Pricing in an Inflationary Economy with Implications for Public Policy*, by Leathers and Janet Gough, examined the causes and implications of farmland price inflation in New Zealand during the previous two decades. They found that in an inflationary economy, the existence of an excess demand appeared to have a strong "pulling effect" on land prices, and discussed factors that may contribute to such excess demand.

Research Economist Geoff T. Harris published Research Report No. 125 (1982), *The Economics of Soil Conservation and Water Management Policies in the Otago High Country,* addressing the economic implications of soil conservation and water management policies for high country tussock grasslands. Conventional cost-benefit analysis was used to evaluate policy alternatives, including a reduction in government financial input that was estimated to result in limitation of the extent of windfall gains in absolute terms, and a reduction in the unequal distribution of programme benefits. Discussion Paper No. 53 (1981), *The Evaluation*

of Job Creation Programmes with Particular Reference to the Farm Employment Programme (FEP), showed that the main obstacle to the success of the FEP was the likelihood that FEP labour would be used increasingly to replace non-subsidised labour.

Tony Beck, whose previous positions had included Research Economist with the New South Wales government, and Lecturer at the University of Canterbury, was involved with a number of AERU projects during the Chudleigh era. Research Report No. 155 (1984), co-written with P.K. Thornton and former AERU Director Barry Dent, *An Information System for The Control of Brown Rust in Barley*, described an information system designed to aid farm decision making on brown rust control in barley, which received considerable coverage in the farming press. Research Report No. 158 (1984), *The Optimal Location of Egg Production in New Zealand*, described a model developed by Beck for the New Zealand Poultry Board to estimate the costs imposed on the egg industry as a result of locational rigidities associated with the existing Production Entitlement system. Beck's analysis indicated that a saving of the order of $1.4 million or approximately 2.3 cents per dozen could be achieved through relocation of production in New Zealand. Research Report No. 163 (1984), *An Analysis of Production, Consumption and Borrowing Behaviour in the North Island Hill Country Pastoral Sector,* was co-written with Barry Dent and based on part of Beck's research for his doctoral dissertation. A flexible simulation model of North Island Hill Country farms was developed to estimate the technical, biological and managerial responses of this class of farm to a range of outside influences of various types. The model showed an apparent lack of short-term response to economic variables, but some short-term stocking rate response to environmental conditions. The report identified future research needs in this area.

Assistant Research Economist Glen Greer published her first research work with the AERU under Chudleigh. Research Report No. 159 (1984), *The Economics of Irrigation Development of the Amuri Plains Irrigation Scheme*, reported a cost-benefit analysis of the impacts of the Waiau Section of the Amuri Plains Irrigation Scheme in North Canterbury, estimating the net benefits at both national and private levels, and examining the influence of government subsidies on farmer returns. This work was widely reported (The Press, 04/03/1985; Marlborough Express 18/01/1985; Northerner 30/01/1985; Southerner 28/01/1985).

Post Graduate Fellow M.T. Laing, developed an econometric model of the New Zealand pastoral sector during his masterate studies, which were supervised by Tony Zwart. Model development was funded initially by the Ministry of Agriculture and Fisheries, but further funding was received from several other organisations interested in the model's application, including the Treasury, the Reserve Bank, and the Meat and Wool Boards' Economic Service. Discussion Paper No. 54 (1981), *The New Zealand Pastoral Livestock Sector: A Preliminary Econometric Model* described the background and theory behind the model, while Research Report No. 127 (1982), *The New Zealand Pastoral Sector: An Econometric Model (Version Two)* detailed the data and specification refinements required to establish causal linkages between livestock numbers, farm production, gross farm income, and capital investment. The refinement of the relationships described in earlier reports and extension of the model to include domestic consumption and stocks were discussed in Research Report No. 137 (1983), *Investment and Supply Response in the New Zealand Pastoral Sector: An Econometric Model*. Laing also produced Discussion Paper No. 70 (1983), *The Pastoral Livestock Sector and the Supplementary Minimum Price Policy*, based on use of the pastoral sector model to determine whether the short-term assistance provided by the Supplementary Minimum Price (SMP) Scheme would encourage resources to be maintained in the pastoral industry, enabling the country to take advantage of any upswing in trade. Laing showed that SMPs had not been

an incentive to production, but had ensured that the levels of farm production were maintained.

During this period Tony Zwart, who was appointed to the Chair of Marketing in 1984, was involved in a number of AERU projects and published two Discussion Papers. Discussion Paper No. 57 (1981), *Japanese Agricultural Policy Development: Implication for New Zealand*, was based on a paper Zwart presented to the Sixteenth Foreign Policy School at Otago University, 1981, and discussed the implications of trade, diplomacy, and foreign policy in Japan's agricultural sector, and its relationship to New Zealand's export market. In Discussion Paper No. 71 (1983), *Marketing Institutions for New Zealand Sheepmeat,* Zwart avoided entering the debate on the relative merits of central control and free enterprise, discussing instead some important principles for future sheep meat marketing systems for New Zealand, including the establishment of a national carcass market, Meat Board pricing, and aspects of government involvement.

Zwart was also involved with the research of AERU postgraduate fellows. He co-authored Research Report No. 140 (1983), *Economic Relationships Within the Japanese Feed and Livestock Sector,* with Post Graduate Fellow, M. Kagatsume. In this report the impacts of Japanese policies concerning the balance of imported final products and imported feedstuffs on New Zealand's trade in these products were evaluated, showing that New Zealand beef and milk producers would benefit significantly from the liberalisation of Japanese import policies. B.W. Borrell, Post Graduate Fellow published his thesis as Research Report No. 124, *The New Zealand Wheat and Flour Industry: Market Structure and Policy Implications,* which also included notes by Tony Zwart. The report discussed the physical distribution of wheat and flour production and processing in New Zealand, and found that large savings could be made by rationalising and centralising the transport, processing, and handling operations of the industry.

Former Post Graduate Fellow Nicola Blyth published one Research Report and three Discussion Papers on her PhD research and its subsequent updating. Research Report No. 138 (1983), *The World Sheepmeat Market: An Econometric Model*, was unabridged version of her thesis. Discussion Paper No. 59 (1981), *The E.E.C. Sheep-Meat Regime: One Year On*, updated her Discussion Paper No. 51 (1980) using an extra year's data to demonstrate that the level of import demand in the EEC was not high at the time, and that increased pressure from interest groups within the EEC for import restriction was a real possibility. Discussion Paper No. 60 (1981), *A Review of the World Sheep-Meat Market: Volumes 1 - 5,* comprised an extensive review of international trends in production, consumption, prices and trade of sheep-meat products. Discussion Paper No. 73 (1983), *Issues Related to the Funding of Primary Processing Research Through Research Associations*, co-written by Blyth and Tony Beck, investigated the issue of government assistance to Research Associations. Arguments for the continuation of government assistance were reviewed, and the requirements for examination of the profitability of New Zealand meat processing, and development of a theoretical framework for examination of distribution of the costs and benefits of processing research were highlighted.

A simulation model that addressed the management potential for smoothing the peak production of lambs on irrigated Canterbury sheep farms, developed by Post Graduate Fellow Nicola Shadbolt, was described in Research Report No. 133 (1982), *Alternative Management Strategies and Drafting Policies for Irrigated Canterbury Sheep Farms.* This showed that early drafting of lambs reduced the risk of drought-induced impacts on lamb growth rates, but increased uncertainty about product returns. Shadbolt's Discussion Paper No. 55 (1981), *The Schedule Price System and the New Zealand Lamb Producer* showed that the saw-toothed

structure of the lamb schedule was a financial disincentive to the production of heavier lambs since heavier carcases may return lower prices.

M.A. (Mike) Krause of the South Australian Department of Agriculture published the results of his masters research project, which was funded by D.S.I.R., as Research Report No. 149 (1984), *The Economics of Controlling Gorse in Hill Country: Goats versus Chemicals*. In this report, co-authored by Tony Beck and Barry Dent, Krause showed that grazing by a combination of goats and sheep was a more cost-effective means of controlling gorse in hill country pastures than chemical control. This report was of particular importance at a time when the herbicide subsidy had just been removed and public awareness of the dangers of agricultural chemical use was increasing, and attracted significant press attention (Daily Telegraph 14/06/1984; Canterbury Farmer, October 1984; Hilton News 02/08/1984; Timaru Herald 15/06/1984; Central Districts Farmer 27/06/1984; Marlborough Express 08/06/1984; Southerner 08/10/1984).

Other Research Reports on a diverse range of subjects published by staff and associates included A.M.M. Thompson's Research Report No. 128 (1982), *A Farm-Level Model to Evaluate the Impacts of Current Energy Policy Options*, described the estimation of the expected response of a Canterbury mixed-cropping farm to a reduction in fuel availability or an increase in fuel prices, using a linear programming approach. Alastair McArthur's Research Report No. 134 (1983), *Economics of the Sheep Breeding Operations of the Department of Lands and Survey*, demonstrated the benefits of a sheep performance recording scheme employed by the Department of Lands and Survey after ten generations of selection. Research Report No. 156 (1984), *An Assessment of the Effects of Road Dust on Agricultural Production Systems* by Peter McCrea discussed an analysis of the impacts on the volume and value of agricultural and horticultural production of road dust drift over farmland adjacent to unsealed roads. The study showed that highest costs were incurred by high value, intensively grown horticultural crops, which may have provided justification for the extension of road sealing programmes in horticultural areas.

E.A. (Ted) Attwood, a distinguished European agricultural economist, and Visiting Fellow in the AERU, wrote four Discussion Papers during 1984. Discussion Paper No. 83, which provided an authoritative and up-to-date picture of the state of the European Economic Community's (E.E.C.) Common Agricultural Policy (C.A.P.) and an analysis of the potential effects of C.A.P. initiatives on New Zealand's access to E.E.C. Discussion Paper No. 85 (1984), *Some Aspects of the Farm Income Situation in New Zealand*, reviewed the availability of farm income statistics in New Zealand, finding them to be inadequate; discussed problems associated with the National Accounts approach; and made recommendations on the collection of farm labour force statistics and formulation of farm income surveys. Discussion Paper No. 87 (1984), *The New Zealand Farm Business and the Current Changes in its Structure* presented a statistical review of the New Zealand agricultural sector and an analysis of a wide range of issues of importance to the sector at the time. Discussion Paper No. 89 (1984), *The Current Situation and Policies of the New Zealand Cereals Sector*, which discussed developments in official policies on the production and marketing of cereals in New Zealand at this time, provided evidence of strong market prospects for arable sector production and suggested that diversion of resources into arable production would be appropriate. Attwood observed that policies to facilitate resource adjustments to meet market changes in the longer term would be in the interests of producers and of the wider economy.

Keith Woodford produced two AERU Discussion Papers at this time. Discussion Paper No. 58 (1981), *Interest Rates: Facts and Fallacies,* discussed the methods of calculating interest rates commonly used in New Zealand using case studies to illustrate the differences between

quoted and effective interest rates. In Discussion Paper No. 61 (1981), *An Evaluation of Farm Ownership Savings Accounts*, Woodford analysed the investment returns from the widely-used Farm Ownership Savings Accounts, and concluded that inflation was likely to outstrip the ability of potential farm buyers to save the required deposit by this means.

Ron Sandrey, Lecturer in the Department of Agricultural Economics and Marketing, later to be appointed as Research Economist in the AERU, was co-author of Research Report No. 144 (1983) *Development of the South Canterbury/Otago Southern Bluefin Tuna Fishery* with Deborah O'Donnell. They reported an analysis of economic and other issues affecting the New Zealand Fishing Industry at the time, with particular reference to the South Canterbury/Otago Southern Bluefin Tuna Fishery. The report highlighted the greater profitability of Bluefin enterprises over the traditional fishing enterprises of the area. Research Report No. 153 (1984), *Dynamics of Herd Build-up in Commercial Deer Production,* written with Tony Zwart, described the development and use of an economic model that explored the impacts of export velvet and venison export prices on domestic deer prices, slaughter throughputs, and venison exports, under a range of price assumptions.

Rod Brodie (Senior Lecturer in the Department of Agricultural Economics and Marketing) also continued to publish the results of his market research as AERU reports during this time. Research Report No. 147 (1984), *The Demand for Milk: An Econometric Analysis of the New Zealand Market,* co-written with Russell Moffitt and Janet Gough and funded by the New Zealand Milk Board, investigated the suitability of econometric modelling as a tool to assist the industry in planning and co-ordinating its marketing programme over the next decade. They identified the key factors influencing milk demand and demonstrated that the New Zealand market was very unresponsive to changes in price. Research Report No. 148 (1984), *The Christchurch and New Zealand Eating Out Markets*, co-written by Brodie and A. (Andy) van Ameyde and commissioned by the Pork Industry Board, provided a general overview of the "eating-out" markets in Christchurch and in New Zealand as a whole, examined the past trends in these markets, and estimated the future growth in response to predicted demographic changes and the expected growth of the tourism industry.

Peter Nuthall (Director of the recently established Kellogg Farm Management Unit) wrote a series of three AERU Discussion Papers during the Chudleigh era, investigating the use of computers as a farm management tool, a cause that had been first espoused by Alastair McArthur twenty years earlier. Discussion Paper No. 66 (1982), *Design Considerations for Computer Based Marketing and Information Systems*, reviewed a number of electronic and computerised information systems designed to reduce the farm costs associated with traditional information and marketing systems, in terms of their advantages and disadvantages, and identified the design features required to achieve desired cost economies. The results of a survey of farmers to examine the potential for development of a "view-data" system, which would allow farmers access to a wide range of information stored on central computers via standard telephone lines, were reported Discussion Paper No. 76 (1983, *A Survey of Farmers' Attitudes to Information*, by R.T. Lively and Nuthall. They showed that there were an appreciable number of areas where a "view-data" system could be used to augment information provided by existing sources, and that almost half the farmers surveyed would be prepared to pay for such a service. A survey was also carried out to investigate the record-keeping practices of farmers, and their attitudes to the use of micro-computers for this purpose. The results of this were reported in Discussion Paper No. 81 (1984), *Farmers Record Keeping and Planning Practices: A Postal Survey*, a co-written by Nuthall and J. Ryde. Nuthall's promotion of computers as farm management tools, and the software development and computer courses run by the Kellogg Farm Management Unit, were publicised widely by the farming and news media.

Other Discussion Papers published by the AERU at this time, canvassed a wide range of subjects. These included: M.M Rich's Discussion Paper No. 65 (1982), *Quality in the New Zealand Wheat and Flour Markets*, which presented a framework for discussion of wheat quality issues and suggestions regarding pricing and segregation policies; R.W. Bohall's (US Department of Agriculture) Discussion Paper No. 67 (1983), *Reaganomics and the New Zealand Agricultural Sector*, a review of the implications of US agricultural and macroeconomic policies for the New Zealand farm sector; and Discussion Paper No. 74 (1983), *Tractor Replacement Policies and Cost Minimisation*, by Peter Nuthall, Keith Woodford and Tony Beck, which described a model developed to aid farmers and advisers in formulating tractor replacement strategies. Glen Greer published Discussion Paper No. 69 (1983), *Farm Finance Data: Availability and Requirements*, which identified gaps in the availability of robust farm finance data for use in monitoring the performance of the rural credit market. Discussion Paper No. 77 (1983), *Monetary Policy and Agricultural Lending by Private Sector Financial Institutions*, written by R.L. (Rod) St Hill (Lecturer in the Department of Agricultural Economics and Marketing) reported an analysis of the relationships between monetary policy and lending to the agricultural sector by private sector institutions. B. Shelby's Discussion Paper No. 78 (1983), *Recreational Substitutability and Carrying Capacity for the Rakaia and Waimakariri Rivers,* which presented an analysis of the impacts of varying levels of abstraction on the numbers of fishing days available on the Waimakariri and Rakaia Rivers. It also examined the extent to which other Canterbury Rivers are directly substitutable for the Rakaia and Waimakariri as fishing resources, and the quality of fishing experiences. Diane Fowler's Discussion Paper No. 84 (1984), *The Economic Potential of Growth-Promoting Agents in Beef,* described an economic analysis of the use of growth-promoting agents in New Zealand beef farming systems. The analysis of the impacts of growth promotants in New Zealand grass-based system was found to be much more complex than analysis of their use in feedlot situations where feed intake can be tightly controlled. Assistant Research Economist S.E. Guthrie and soon-to-be AERU Director Ralph Lattimore's Discussion Paper No. 88 (1984), *The Agricultural Sector in New Zealand: A Joint Farm-Industrial Perspective* reported research undertaken to examine the macro-economic characteristics of the agricultural sector and identified a number of important relationships for in-depth analysis on a product/industry basis in order to understand their relative impacts on the competitive position of New Zealand agriculture. They found that the decline in the size of the agricultural sector relative to the New Zealand economy reflected both changes in the composition of the sector and an overall reduction in its size. While the reduction in size was likely to be attributable largely to the declining terms of trade for agricultural sector exports, compositional change reflected an increase in the profitability of processing relative to production of some products; differences in the levels of government assistance to different industries, and differences in the rates and levels of technological change.

Peter Chudleigh resigned from the AERU towards the end of 1984, to return to Queensland and establish his own research and consultancy business.

2.3.2 Ralph Lattimore, 1984-1986

Above:
Ralph Lattimore,
Date unknown.

Source: Lincoln University Photo Archive.

Ralph Lattimore was AERU Director between late 1984 until mid-1986, during which time the Unit published 23 Research Reports and 17 Discussion Papers. Lattimore had returned from British Columbia where he had been an Associate Professor of Agricultural Economics at the University of British Columbia to take up a position as Senior Lecturer in the Agricultural Economics and Marketing Department at Lincoln, which he continued to hold during his directorship of the AERU. He had previously held positions with the Ministry of Agriculture and Forestry (as head of the commodity markets analysis unit MAF Economics Division), the Department of Trade and Industry, and the International Development Research Centre. On his appointment in 1985, which was widely reported (Canterbury Central News; The Press 09/11/1984; Marlborough Express 09/11/1984; Southerner 11/02/1985), he announced that the AERU was to have a "broader agenda" in future.

At that time Ron Sheppard was appointed as Assistant Director of the AERU, after several years as a Senior Research Economist working in the areas of marketing, international trade and economic policy. A number of staff changes had occurred by this time and in 1985 the AERU staff consisted of Lattimore; Sheppard; John Pryde as Research Fellow in Agricultural Policy; Senior Research Economist Roger Lough; Research Economists, Diane Fowler, Glen Greer, Sandra Martin and Russell Moffitt; Research Sociologist John Fairweather; and Assistant Research Economists John E. Chamberlain, T. Peter Grundy, Patrick McCartin, Peter McCrea, Susan M. Scanlan Peter Seed took up a postgraduate fellowship and secretarial support was provided by Linda M. Bellamy and Rosemary Searle.

Under Lattimore the AERU continued to publish research on a wide range of policy issues and problems facing the agricultural sector. Two additional reports were added to each of the series of reports on regular farmer surveys. Russell Moffitt's Town Milk Producers Survey series (Research Report No. 175 (1985); Research Report No. 183 (1986) and Moffitt also produced two related reports, Research Report No. 176 (1985), *A Financial and Economic Survey of South Auckland Town Milk Producers and Factory Supply Dairy Farmers, 1983-84,* and Research Report No. 182 (1986), *A Financial and Economic Survey of South Auckland Town Milk Producer and Factory Supply Dairy Farmers, 1984-85*, which compared the economic performance of town milk and factory supply dairy farms in the South Auckland region.

The Wheatgrowers' surveys carried out by Roger Lough and Patrick McCartin also carried on for only two more years (Research Report No. 170 (1985); Research Report No. 171 (1985); Research Report No. 184 (1986). On a related subject Lough also reviewed the maize industry, concluding that further expansion in non-dairying central North Island regions of the Manawatu and Poverty Bay would be possible as part of balanced livestock/cropping policies (Discussion Paper No. 91 (1985), *North Island Maize Production, 1983-84*). The Farmer Opinions surveys, conducted by John Pryde and Patrick McCartin were also discontinued after publication of Research Report No. 167 (1985) and Research Report No.181 (1986).

Sandra Martin's primary research interest during this period, the marketing of New Zealand's agricultural and horticultural products was the subject of three Research Reports during the period including Research Report No. 177 (1986), *Optimal Pricing and Promotion for Agricultural Marketing Agencies,* co-written with L. Young (University of Texas, USA), under the supervision of Tony Zwart and based on her doctoral thesis. This work analysed aspects of the economics of market segmentation by agricultural marketing agencies including the optimal allocation of advertising expenditure among different segments.

In 1985, a study group known as The CAPS/AERU Marketing Study Group consisting of Professor Alan Rae (Director, Centre for Agricultural Policy Studies at Massey University), Tony Zwart, and Sandra Martin was established by the Economics Division, Ministry of Agriculture and Fisheries to address agricultural marketing issues that were of concern in 1985 and 1986. Three reports were produced by this group including Report No. 178 (1986), *A Contractual Framework for Evaluating Agricultural and Horticultural Marketing Channels,* by Martin and Tony Zwart, which evaluated a contractual framework for the analysis of marketing issues; a report by Alan Rae of CAPS that provided a literature review on the theories and analytical methods used in market channel analysis, and Research Report No. 179 (1986) *An Integrated Framework for Analysing Agricultural Marketing Issues*, co-written by Martin, Rae and Zwart which provided an overview of both earlier reports

Research Sociologist John Fairweather published the first of the many AERU reports he was to produce in his almost three decades with the AERU, including two Research Reports and two Discussion Papers dealing with land policy and farm structural issues. Research Report No. 165 (1985), *Land Policy and Land Settlement in New Zealand: An Analysis of Land Policy Goals and an Evaluation of their Effect* examined the relationship between farm size and the sequence of rural land policy changes that had occurred over a number of decades. In this Fairweather concluded that between 1951 and 1971, government land policies directed at the disaggregation of large farms were incompatible with production policies, which appeared to foster the trend towards increasing farm size. Research Report No. 166 (1985), *Farm Enlargement in New Zealand*, described the extent of farm aggregation in New Zealand and the factors influencing farmer decisions about farm aggregation, based on analysis of a farmer survey. Discussion Paper No. 99 examined two arguments used to justify proposals for a government-sponsored closer settlement policy and presented a range of policy options for achieving closer settlement while restricting land aggregation. Research Economist Ron Sandrey produced four AERU papers during the Lattimore years. Research Report No. 164 (1985), co-written with D.K. O'Donnell (Scientific Liaison Officer with D.S.I.R.), *New Zealand's Inshore Fishery: A Perspective on the Current Debate*, examined historical, distributional and economic efficiency aspects of the management of New Zealand's inshore fishery, reviewing the theoretical issues to be considered when evaluating management options. The authors stressed the importance of formulating polices that are consistent with established economic and social objectives. The costs and benefits of the biological control of gorse in New Zealand were examined in Research Report No. 172 (1985), *Biological Control of Gorse: An Ex-Ante Evaluation.* Maori claims to New Zealand fisheries resources, and the economic efficiency aspects of meeting those claims were the subject of Discussion Paper No. 101 (1986), *Maori Fishing Rights in New Zealand: An Economic Perspective*, which concluded that a change to Maori ownership of fishing rights was unlikely to compromise economic efficiency. Discussion Paper No. 102 (1986), co-written with T.E. Dickinson (Department of Farm Management and Rural Valuation), *Government's Role in Adverse Events Assistance*, examined a range of issues related to adverse climatic events. These included farm management practices for dealing with the impacts of such events, the potential role of private sector insurance schemes, and the potential impacts of government

intervention, including the impacts on farm management practices if the ad-hoc provision of assistance packages is expected.

The marketing of New Zealand's primary products remained a research focus in the AERU. Research Report No.173 (1985) *The Competitive Position of New Zealand Fresh Fruit Exports,* by M.T. Laing, S.A. Hughes and R.L. Sheppard assembled information on the structure of the competition facing New Zealand fresh fruit exporters in major export markets, concluding that South Africa was New Zealand's largest competitor for European fruit market access The information collected in this study was considered to be essential for analyses of appropriate market structures for New Zealand fruit exporters. In Research Report No 174 (1985), *Marketing Structures for the Horticultural Industry,* Nick Brown and Ralph Lattimore examined possible structures for export marketing organisations. They analysed a number of export markets in order to determine whether export controls for fresh fruit could be justified on the basis of potential market gains, and found that market share was a major factor in determining whether government intervention would be of benefit. Although New Zealand held only minor shares of country markets for fresh fruit, it did hold a significant share in certain product markets, specifically where successful marketing strategies had been adopted; where New Zealand has an off-season supply advantage in the more perishable; where New Zealand has a slight seasonal differential in the supply of fruit; and where New Zealand was exporting relatively "new" fruits. In those markets gains from intervention were considered to be possible and it was recommended the impact of factors other than market share in these markets be investigated. In S.A. Hughes' Research Report No. 168 (1985), co-written with Ron Sheppard, *Market Prospects for Maize,* analysed the potential for maize grain the New Zealand market, showing that within the short-term (3 to 5 years), maize production would probably decline slightly as a result of competition from wheat at the farm level. They concluded that the future for the cereals sector remained unclear, but that the recent removal of government assistance from other agricultural sector should enhance the ability of the cereals sector to compete for resources.

A number of other Research Reports on a diverse range of subjects were published by AERU staff and associates during this time. M.D. (Mike) Clemes' Research Report No. 169 (1985), co-written with L.D. (Les) Woods, *Factor Cost Analysis of a New Zealand Meat Processing Company*, based on his thesis research, provided an economic interpretation of killing and processing factor costs for sheep and lamb in New Zealand' Clemes concluded that the process of "spreading the kill", generally regarded as the best approach to reducing killing and processing charges, was not only questionable in its effects, but also inhibited the expansion of "further processing" by the industry. Research Report No. 180 (1986), *Labour Mobility Between New Zealand and Australia*, by R.L. (Rod) St Hill (Lecturer in the Department of Agricultural Economics and Marketing) examined labour mobility issues between Australia and New Zealand, set out a methodology for analysing the subject, but concluded that a robust database including remuneration and employment information cross-sectional migration studies were to be carried out reliably. Lattimore published three Discussion Papers during his time as AERU Director, including Discussion Paper No. 94 (1985), *New Zealand Economic Development: A Brief Overview of Unbalanced Industry Growth,* which explored the effects of the low priority accorded to the export sector under New Zealand's structural policy over a long period. He found that until the 1960s rapid technological change had insulated the agricultural sector from these effects. However, from that time the impediments to growth became more obvious, and attempts were made to partially offset protection for imports with tariff compensation for agricultural export industries. Lattimore concluded that little information was available on the structure, conduct and performance of major industries (with the exception of farming) and that a wide range of policy changes was required to ensure that regulation and other distortions did not adversely

affect the export sectors, including agriculture, in future. Discussion Paper No. 96 (1985), *Supply Response Parameters in New Zealand Agriculture: A Literature Search*, co-written by Mary Belton-Wood, reviewed New Zealand studies of agricultural supply response that have estimated supply response parameters for use in a wide variety of policy and forecasting studies. The work provided background for, and estimates of response parameters to be used in, an analysis, conducted by the O.E.C.D. (Organisation for Economic Cooperation and Development). The O.E.C.D. analysis was to examine the medium term impacts of multilateral adjustments in the agricultural protection policies that had been implemented by a number of countries, including New Zealand. The major products examined in the New Zealand study were beef, wool, sheepmeats, dairy products and grain.

Ted Attwood, Visiting Research Fellow, wrote two more Discussion Papers for the AERU during this time, including: Discussion Paper No. 90 (1985), *The Current Situation and Future Development of the New Zealand Pig Industry*, a sequel to his earlier study of the cereals sector in New Zealand. This was a comprehensive review of statistical and economic information on the current situation of the pig industry, which assessed production efficiencies and marketing strategies, and recommended strategies for future development. Discussion Paper No. 95 (1985), *Economic Aspects of Agricultural Education and Training in New Zealand* examined vocational training in farming, providing a comprehensive overview of the system and a preliminary quantitative assessment of the value of vocational training to one group of farmers. He showed that the economic performance of farms managed by farmers who had been exempt from the educational requirements of the Land Settlement Scheme had been as good as those managed by farmers who had who met those requirements.

John Rathbun and Tony Zwart prepared Discussion Paper No. 92 (1985), *The Sandwich Algorithm for Spatial Equilibrium Analysis,* which explored the usefulness of an algorithm for analysing some complex transport and pricing issues. They found the method to be capable of handling much of the inherent non-linearity associated with spatial equilibrium analysis, particularly when considering supply and demand curves and the economies and diseconomies of scale involved in processing and transportation activities. Discussion Paper No. 93 (1985), by John Pryde and Lindsay Bain, *A Review of Agricultural Credit in New Zealand,* updated early data on the finance that had been reported in two 1984 reports (Discussion Papers No. 82 and 86). These data showed that the rising level of farm costs was significantly reducing the benefits that should have been achieved by the deregulation that had occurred during 1984. Diane Fowler's Discussion Paper No. 98 (1985), co-written with Ron Sheppard and S.A. Hughes, *An Examination of Alternative Marketing Structures: A Literature Search,* comprised a literature review of the types of marketing systems used for a range of agricultural products internationally, and assess these in terms of their relevance to the New Zealand situation. He review was undertaken in conjunction with a study by R.H. (Roger) Juchau (Professor of Finance and Accounting at Lincoln College). Discussion Paper No. 100 (1986), by R.H. Juchau, *Accounting Developments and Implications for Farm Business*, discussed techniques for financial reporting and management accounting, and suggested that the adoption of some newer techniques would be beneficial.

Lattimore resigned his position in mid-1986 and returned to the Department of Economics and marketing in a full-time capacity as Reader in Agricultural Economics.

2.3.3 Pryde, 1986-1988

Above: John Pryde,
Date unknown.

Source: Lincoln University Photo Archive.

John Pryde, who had been a Research Fellow in the AERU for a number of years, assumed the Directorship of the AERU, on Lattimore's resignation. He assumed the position somewhat reluctantly, on the understanding that it would be 'caretaker' position until a final decision could be taken on the future of the Unit. In fact Pryde was to remain as Director for more than a year and guided the AERU through a particularly difficult period in its history. Pryde had had a distinguished career in the New Zealand public sector, and in economics, before coming to Lincoln. His citation as a Life Member of the New Zealand Association of Economists credited him with playing "…a significant part in establishing the place of economics in New Zealand public life".

By this time the availability of funding for research had been significantly reduced, and both the core funding from the D.S.I.R. and funding for the three long-term series of farmer surveys was discontinued, as a result of the agricultural and science sector restructuring started in the mid-1980s. The AERU was forced undertake significant restructuring; staff numbers were reduced, and at the end of 1987 the position of full-time director was disestablished and a Management Committee consisting of A.C. (Tony) Bywater, Professor of Farm Management; Roger Juchau, Professor of Accounting and Finance; A.C. (Tony) Rayner, Professor of Agricultural Economics; Tony Zwart, Professor of Marketing; John Pryde, Ron Sheppard and Sandra Martin was set up. Some staff moved to positions in other Departments and continued to publish through the AERU. Despite these upheavals the remaining staff, and members of the Departments associated with the AERU continued to publish AERU papers during this time although the publication output was considerably curtailed.

The last reports from each of the farmer survey series were published, including Research Report 184, the final wheatgrowers' survey; Research Report No 188, the last survey of farmer intentions and opinions in 1986; and, in 1987, the last of Russell Moffitt's surveys of town milk producers (Research Report No. 190). Peter McCrea continued his analysis of the effects of road dust with Research Report No. 185 (1986), *An Assessment of the Effects on Horticultural Production of Fugitive Dust and Ash from the Proposed Waikato Coal-Fired Power Station Activities.* In this study *the* possible effects of dust and ash pollution were found to include reduced photosynthesis; increased pest and disease incidence; less effective pollination; toxic effects on, and burning, of leaves; and yield losses. McCrea concluded that the extent of horticultural production losses would depend largely on the choice of power station locations and the operational procedures employed. A comprehensive review of the theories put forward to explain land price movements was published by Peter Seed, Ron Sandrey and B.D. (Bert) Ward (Senior Lecturer in the Department of Agricultural Economics and Marketing) as Research Report No. 186 (1986), *A Study of the Determinants of Fattening and Grazing Farm Land Prices in New Zealand, 1962 to 1983*. Three different land price models, based on the assumptions that a) that farm land prices were a function of expected net rental income; b) that farm land prices were a function of expected net rental income and expected capital gain; and c) that farm land prices were a function of expected net rental income and expected inflation rates, were tested in the New Zealand situation. A number of policy implications were drawn from the results of this work including the suggestions that government intervention to increase expectations of farm incomes would contribute to rising real land prices; and that subsidised interest rates may encourage the purchase of farm land as a repository for wealth.

John Fairweather's Research Report No. 187 (1987), *Farmers' Responses to Economic Restructuring: Preliminary Analysis of Survey Data*, reported the results of a survey of farmers in Hurunui and Clutha counties undertaken in August/September 1986, providing a general overview of farmers' responses to restructuring, and including data on the farm financial situation. Research Report No. 189 (1987), *Economic Adjustment in New Zealand: A Developed Country Case Study of Policies and Problems,* written by Ralph Lattimore and based on a paper presented to a seminar in Wellington sponsored by the Reserve Bank of New Zealand and the International Monetary Fund in 1986. The paper reflected on on-going research into trade and policy issues with some emphasis on the agricultural and agribusiness aspects; reviewed the previous fifty years of Government experiments in economic policies and concluded that "it is increasingly clear that the experiment as a whole has failed."

Visiting Lecturer in the Department of Farm Management and Rural Valuation, N.J. Williams, described techniques for including taxation effects in investment analysis in Discussion Paper No. 103 (1986), *The Treatment of Taxation in Capital Investment*. The proceedings of the first meeting of the New Zealand Rural Economy and Society Study Group, held at Lincoln College in 1986, were edited by John Fairweather and published as Discussion Paper No. 105. Seminar participants concluded that there was a need for the promotion of rural research that could provide informed commentary and the basis of effective policies for rural society, and identified a range of issues for future research. The proceedings of the New Zealand Branch of the Australian Agricultural Economic Society were published as a two-part AERU Discussion Paper No. 106 (1986), *Papers Presented at the New Zealand Branch of Australian Agricultural Economic Society Conference, Blenheim, June 1986.*

A particularly important work of the era, AERU Discussion Paper No. 109 (1987), a book edited by L.T. Wallace and Ralph Lattimore, who continued to publish through the AERU, entitled *Rural New Zealand – What Next?*, is still in circulation today. It examined key areas of concern for New Zealand, including macro-economic forces; production, resources and technology; demand for New Zealand food exports; New Zealand farms and agribusiness; markets and marketing; the role of government. Issues that had been for concern over a long period and emerging concerns were reviewed. Among the 30 contributions to this book were articles written by many of New Zealand's best known economic commentators.

Lattimore also wrote Discussion Paper No. 104 (1986), *Farmlands Grain (NZ) Society Ltd – A Marketing Audit, 1980-84*, which had been commissioned by the Farmlands Grain (NZ) Society Ltd as an audit of the marketing and administrative performance of the Society for the four pool years, 1981-1985 inclusive. The audit found "every indication" that the Society could maintain and even enhance its market leadership position in the future.

In 1987, the AERU, was renamed the Agribusiness and Economics Research Unit, instead of the Agricultural Economics Research Unit, to reflect the broadened scope of research in which staff had become involved. In addition to the traditional research areas of agricultural economics and marketing, AERU expertise now included research evaluation; institutional and policy analysis,; resource economics; finance and taxation research; and research into a diverse range of issues for an equally diverse range of domestic and international, public sector and private sector clients. It was hoped that the name change would draw attention the AERU from an even wider spectrum of clients. The name change was accompanied by a change in the logo, and cover designs for the Unit's published outputs as shown below.

2.4 Zwart and Cullen (1988-2000)

2.4.1 Tony Zwart, 1988-1998: The Early Years (1987-1991 inclusive)

Above: Tony Zwart,
Date unknown.

Source: Lincoln University Photo Archive.

By early 1988, the staff of the AERU had been reduced to Tony Zwart, who had assumed the role of part-time Director, Ron Sheppard as Assistant Director, Research Economists Russell Moffitt and Glen Greer, Assistant Research Economist Peter Grundy, Research Sociologist John Fairweather, and Secretary Michelle Yen. They were joined in 1989 by Research Officer Lorna Urquhart. Numbers remained low for many years, and there were few changes in staff. In 1990, Dr Norah C. Keating (Department of Family Studies, University of Alberta) joined the Unit as a Visiting Research Fellow, and Michelle Yen was replaced by Jan Clark as Secretary. 1991 saw the departure of Peter Grundy as a Research Officer, and welcomed Tessa M. Ferguson to that position. In 1992, John Fairweather was promoted to Senior Research Officer, while S.F. (Soraiya) Gilmour and G.F. (Glen) Thomson joined the Unit as Research Officers after the departure of Lorna Urquhart. Catherine M. Scully and Katherine M. Hansen replaced Soraiya Gilmour and Tessa Ferguson during 1993 and 1994 but by 1995 The AERU staff had been reduced to Senior Research Officer John Fairweather, Research Officers Glen Greer and B.P. Peebles and Visiting Research Officers Daniel M. Gouin and Noëlla Jean from Quebec. Peebles left the Unit in 1995, anthropologist Carolyn Morris was appointed as a Research Officer and Lance McCarthy as Research Assistant.

Tony Zwart, remained Professor of Marketing during his directorship of the AERU, and although he recalls his role in the AERU as being largely supervisory, he remained a prolific researcher primarily in marketing and econometric modelling throughout his directorship. Staff numbers were low during this period, but the AERU continued to operate as a research co-ordinating body for the Agricultural Economics and Marketing Department and the Department of Farm and Property Management, Accounting and Valuation and published 49 Research Reports and 38 Discussion Papers during Zwart's nine-year Directorship. Many of these papers, particularly between 1988 and 1991, dealt with the impacts of deregulation of New Zealand primary production sectors.

Peter Grundy, published six Research Reports in the period 1988-1991 (inclusive). Research Report No. 191 (1988), written with Gary R. Griffith (Visiting Research Fellow, Senior Research Scientist with the New South Wales Department of Agriculture), *The Supplementary Minimum Price Scheme: A Retrospective Analysis* continued the AERU's work on pastoral sector production and policy analysis. The report described an ex-post evaluation of the impact of the Supplementary Minimum Price Scheme (SMP) on the New Zealand pastoral livestock sector over the period 1978/79 to 1984/85, and presented forecasts for the following five year period. Research Report No. 192 (1988), co-written with Ralph Lattimore and Tony Zwart, *New Zealand Livestock Sector Model: 1986 Version, Volume 1 and 2*, presented the results of a refinement of the Mike Laing's econometric model of the New Zealand livestock sector, with updated data and improved "user-friendliness". The derivation of a model defining the relationship between wool characteristics and market price that provided some useful first steps towards a conceptualisation of wool markets was discussed in Research Report No. 197 (1988) *Demand for Wool by Grade*, by Zwart and Grundy.

In 1989, Grundy was also the author of series of papers commissioned by the D.S.I.R., which formed part of a body of work on the economic evaluation of research that was conducted by the AERU at this time. All three described assessments of expected economic impacts of D.S.I.R. research into the biological control of weeds and pests. These included Research Report No. 200 (1989), *An Economic Evaluation of Biological Control of Rose-Grain Aphid in New Zealand*, which had been successfully implemented. The remaining two reports demonstrated the use of ex-ante economic analysis to evaluate research programmes which have highly uncertain outcomes, by incorporating differing probabilities of success. They included Research Report No. 201 (1989), *An Economic Evaluation of Biological Control of Sweet Brier* and Research Report No. 202 (1989), *An Economic Evaluation of Biological Control of Hieracium*.

In an extension of the AERU programme of research evaluation Glen Greer and Ron Sheppard used non-market valuation techniques to estimate the potential benefits of D.S.I.R research into the biological control Of Old Man's Beard (Clematis vitalba). The study, which was funded by DSIR and a number of other government and local government bodies was presented in Research Report No. 203 (1990), *An Economic Evaluation of the Benefits of Research into Biological Control of Clematis Vitalba*. Discussion Paper No. 112 (1987), co-written with John E. Chamberlain, *Economic Evaluation of Matua Prairie Grass as a Pasture Species on Canterbury Sheep Farms*, reported an example of an economic evaluation of alternative farm production and management systems, based on scientific trials in combination with on-farm experience.

Greer's publications during the early period of Zwart's Directorship also included Research Report No. 218 (1992), co-written with Gary Rae (MAF Consultancy Services, Ashburton), *An Economic Evaluation of Changes in the Allocation of Water for Irrigation from the Ashburton River*, which investigated the economic implications for differing groups farmers of changes in the availability of irrigation water from the Ashburton River. The study showed that the impacts of changes in water availability differed markedly amongst different groups of irrigators.

During this period, Ron Sheppard wrote Research Report No. 195 (1988), *Milk Purchasing: A Consumer Survey in Auckland and Christchurch* describing the results of a consumer survey on milk purchasing after deregulation, which was carried out during February and March 1988. The study indicated that there were significant differences between Auckland and Christchurch with respect to the adoption of new packaging for milk products. Research Report No. 210 (1991), *Attitudes to Pests and Pest Control Methods: Results from a Sample Survey of the NZ Population in February 1991,* co-written by Sheppard and Lorna Urquhart, concluded that the public was concerned about New Zealand's pest problems. While the majority of survey respondents did not support the introduction of biological control agents, public resistance to the introduction of biological control was no greater than resistance to the use of many other control measures. The results of a review of the supply side of the town milk industry, in the light of the partial deregulation of New Zealand's town milk industry, were presented in Discussion Paper No. 122 (1988), *A Review of the Deregulation of the New Zealand Town Milk Industry*. Sheppard's analysis found that deregulation had resulted in significant company ownership changes and some changes in the supply arrangements in the northern part of the North Island; some consolidation of processing plant ownership in the southern North Island; and very little change in the South Island. This work continued the AERU's involvement with the Town Milk Industry, and used data from Russell Moffitt's survey reports as a basis for the analysis.

The many other AERU publications during the early years of the Zwart era included John Gibson's Research Report No. 193 (1988), *An Economic Analysis of the 1986 Deregulation of the New Zealand Egg Industry*, which found that predicted gains in consumer welfare, as a result of the removal of industry-specific controls in the New Zealand egg industry post-deregulation, had to be realised. An analysis of the effective rates of government assistance to the tourism sector from 1981 to 1984 was reported by Ron Sandrey and Susan Scanlan in Research Report No. 194 (1988), *Assistance to the Tourist Industry*. Research Report No. 198 (1988), *Financial Market Liberalisation in New Zealand: An Overview*, a revised version of a paper presented at a seminar at the University of Newcastle, in 198 by Rod St Hill (Senior Lecturer in the Department of Agricultural Economics and Marketing, presented an overview of some aspects of financial market liberalisation. St Hill concluded that, since 1984, the financial assets held by the New Zealand public had increased; there had been significant changes in market structure; but there had been little change in market concentration and profitability.

Research Report No. 206 (1990), *Tax Shields: Their Implications for Farm Project Investment, Risk and Return*, co-written by Peter McCrea, Peter Grundy and D.C. (David) Hay, described an analysis of taxation measures to assist farmers in ameliorating the risks of the farm business environment, before deregulation. Visiting Research Fellow Norah C. Keating from the Department of Family Studies, University of Alberta, applied her analytical experience studies of the intergenerational transfer of farms in Canada to examination of the New Zealand situation. Research Report No. 208 (1991), *Generations in Farm Families: Transfer of the Family Farm in New Zealand*, a detailed study of how farmers transfer the family farm to the next generation, was written in conjunction with external researcher Heather M. Little. Farm Management postgraduate student, G.A. Anderson, co-wrote Research Report No. 209 (1991), *Determination of Farmland Values in New Zealand: The Significance of Financial Leverage*, with Gerald Frengley (Reader in the Farm Management Department) and Bert Ward (Senior Lecturer in the Economics and Marketing Department). This report, which was regarded as a significant contribution to the literature available on farmland valuation, described an analysis of the role of financial leverage in the establishment of farmland values. The authors suggested that the increasing debt levels of the marginal purchaser during this period could explain, at least in part the observed increases in farmland prices. David A. Stallings, a visitor from the Academic, Agriculture and Trade Analysis Division, Economic Research Service, US Department of Agriculture, was the author of Research Report No. 211 (1991), *Administered Protection in the United States during the 1980s: Exchange Rates and Institutions*. In this report Stallings examined the use of antidumping and countervailing duty regulations by the US as barriers to trade, and highlighted the urgent need to bring this activity to the notice of those involved in trade access negotiations.

Research Sociologist John Fairweather authored five other Research Reports and one Discussion Paper in the period 1988-1991 on a diverse range of subjects. Research Report No. 196 (1988), *Employment and Unemployment in Rural Southland,* documented the results of survey undertaken to measure the economic pulse of rural Southland. Research Report No. 199 (1989), *An Economic Evaluation of Coppice Fuelwood Production for Canterbury*, co-written by Fairweather and A.A. MacIntyre, examined the prospects for fully-mechanised biomass production from short-rotation eucalyptus trees grown as a field crop. The study showed that the SRIC biomass production from *eucalypts* was viable as a new crop for Canterbury only with the use of good management practices and achievement of high yields. People's perceptions of food were examined using a technique known as the Q-method in Report No. 204 (1990), *The Q Method and Subjective Perceptions of Food in the 1990*. Fairweather concluded that this technique was of value in understanding public perceptions

and the differences in these between different groups in society, and was later to employ it in a number of AERU projects. Fairweather and Norah Keating co-authored Research Report No. 205 (1990), *Management Styles of Canterbury Farmers: A Study of Goals and Success from the Farmers' Point of View*, which discussed the results of a study of the management styles of farm managers in Canterbury, in order to determine how, and why, farm management practices differ. They concluded that when farmers describe their management goals in the terms they prefer, it is possible to identify three distinct management styles. Research Report No. 207 (1990), by Fairweather and PhD student Hugh Campbell, *Public Drinking and Social Organisation in Methven and Mt Somers*, described everyday drinking habits in Methven and Mt Somers in an attempt to explain public drinking in terms of culture, interaction and social structure.

John Fairweather's Discussion Papers during this period included Discussion Paper No. 124 (1989), *Some Recent Changes in Rural Society in New Zealand*, in which he provided an overview of recent changes in New Zealand rural society, on the basis of the official statistics available, which showed a steady rise in unemployment and a decline in average farm size. Fairweather concluded that anecdotal evidence of the increasing numbers of corporate farms was not supported by the official data. Fairweather was also the editor of the proceedings of two symposia that were published as AERU Discussion Papers. They included Discussion Paper No. 113 (1987), *Proceedings of the Rural Economy and Society Study Group Two-Day Symposium on Rural Research Needs, 7-8 July, 1987*, which discussed a range of rural issues including revamping Federated Farmers; fostering work and school exchanges; education programmes for major life changes; devolving decision-making to the regions; research into international consumer food preferences; and promoting affirmative action for rural New Zealand in the media. Discussion Paper No. 129 (1991), *Proceedings of the Rural Economy and Society Section of the Sociological Association of Aotearoa (NZ)*, included papers that discussed a range of issues relating to the discipline of rural sociology in New Zealand. Fairweather and Hugh Campbell co-authored Discussion Paper No. 128 (1991), *Methven and Mt Somers: Report on Socio-Economic History and Current Social Structure*, which was a continuation of their previous work in this area.

Other Discussion Papers written by AERU staff during the early years of Zwart's Directorship included John Pryde's Discussion Paper No. 114 (1987), *A Summary of the Financial Position of Canterbury Farmers, Mid-1987*, which presented the results of an investigation into the financial position of Canterbury Farmers , hat had been funded by the Lincoln College Foundation. The analysis, which was based on discussions with a wide range of organisations involved in the broader agribusiness sector, showed deterioration in the equity position of many Canterbury farms during the period 1984-1987. This trend was considered to have important implications for the future financial position of these farms. Russell Moffitt published two Discussion Papers that stemmed from a trip to Chiba University near Tokyo, Japan, in late 1986. Discussion Paper No. 110 (1987), *Dairying in Japan and the Benefits of Adopting New Zealand Pasture Grazing Techniques,* as an examination of the Japanese dairy industry, and the potential benefits of the adoption of New Zealand pasture grazing techniques in Japan. Moffitt, demonstrated that the need for expensive imported concentrate dairy feeds could be reduced if Hokkaido dairy farmers adopted concentrated stocking and rotational pasture grazing, practices during warmer weather. Discussion Paper No. 111 (1987), *Selling New Zealand Products in Japan,* provided insight into the commercial and cultural differences that affected business negotiations with the Japanese at that time, for the benefit of businesses targeting Japanese markets. The author discussed the political and economic behaviour of Japan, as well as Japanese ways of living, modes of thinking and other cultural differences between the peoples of Japan and New Zealand.

Departmental staff made extensive use of the AERU as a publishing platform during this time. Tony Zwart's Discussion Paper No. 117 (1988), *The New Zealand Sheepmeat Industry and the Role of the New Zealand Meat Producers' Board*, co-written with former AERU staff member Sandra Martin, (now a Senior Lecturer in Farm Management) contributed to the debate over the roles of New Zealand meat industry participants. Zwart and Martin undertook a study to gauge the reactions of meat industry participants to possible changes in the functions of the New Zealand Meat Producers' Board, which suggested that responsibilities should be allocated in a manner that more clearly defined the respective roles of the producer board and Government. Ron Sandrey wrote two Discussion Papers during this period. Discussion Paper No. 107 (1987), *Gorse and Goats: Considerations for Biological Control of Gorse*, described an extension of Sandrey's previous research on this subject. In this paper, he reviewed the available evidence on the use of gorse as a fodder source for goats, particularly in the light of the expected impact of a biological agent on the availability of gorse. The key determinants of the economic value of female deer were investigated in Discussion Paper No. 108 (1987), *Red Deer: The Economic Valuation*, published on behalf of Red Deer Research. A current value was estimated of the basis of these determinants to assist those contemplating investment in red deer. Sandrey concluded that deer farming would not provide a guaranteed return to investors.

Peter Nuthall, who had been involved with the AERU during the Philpott era, was at this time Head of the Kellogg Farm Management Unit, attached to the Department of Farm Management and Rural Valuation, which was involved in the development of computer software for farm businesses. Nuthall produced three more AERU Discussion Papers on aspects of the use of computational models for farmers. The first, co-authored with Peter Oliver (Senior Research Officer, Kellogg Farm Management Unit), was Discussion Paper No. 118 (1988) *Desirable Attributes of Computerised Financial Systems for Property Managers*, a guide to the issues to be considered by farmers when choosing software systems. Discussion Paper No. 120 (1988), *Challenges in Computer Systems for Farmers*, explored past developments in farm computing, reviewed farmer requirements and provided some comments on expected developments in farm-oriented computer software. The ideas involved in the concept of "expert systems" were reviewed, and the probable place of expert systems in farm management discussed, in Discussion Paper No. 123 (1989), *Do Our Experts Hold the Key to Improved Farm Management*. An "expert system" approach is seen as a way of providing management assistance/advice on an "on-call" basis

J.K.D. Wright (Department of Economics and Marketing) published Discussion Paper No. 130 (1991), *Evolutionary Bargaining Games*, which was an academic foray into bargaining theory, specifically a simple Nash demand game which was analysed in an evolutionary context. Ralph Lattimore's) Discussion Paper No. 126 (1989), co-written by Lattimore and Ewan McCann (Department of Economics, University of Canterbury), *Marketing Boards and Anti-Trust Policy,* presented some views on the relationship between the Acts under which the producer boards operate and the Commerce Act of 1986, with particular reference to the interpretation of the powers contained in the Apple & Pear Marketing Act, 1948. The authors concluded that the second tier levy imposed in the apple industry cost distortions on the industry and social costs on the nation by inducing reduction of production and export volumes.

In addition to Department Staff, Visiting Research and Teaching Fellows also used the AERU Discussion Paper series as a publishing vehicle for publishing their research. Gary Griffiths' (Visiting Research Fellow, New South Wales Department of Agriculture, Senior Research Scientist in the Division of Marketing and Economic Services) wrote Discussion Paper No. 116 (1988), *An Overview of Government Policies for the New Zealand Livestock*

Industries, with Emphasis on Recent Price Stabilisation and Price Support Schemes. Griffiths concluded that a re-examination of the sources of instability in the pig and pastoral industries, and reassessment of whether greater stability would be worth pushing for, may have been appropriate. A paper written as reference for bursary-level agriculture/horticulture courses, and to provide others with insights into selected primary industries in New Zealand, was written by K.B. Nicholson (Visiting Teaching Fellow) and published as Discussion Paper No. 127 (1990), *Marketing of Agricultural and Horticultural Products*. Rod St Hill wrote Discussion Paper No. 115 (1987), *A Case for Removal of Tariff Protection*, which had been commissioned by Federated Farmers. After examination of the case for e abolition of import protection for New Zealand industries, St Hill concluded that New Zealand's future economic welfare was most likely to be higher without import protection, and recommended a complete removal of protection over a five-year period.

The New Zealand branch of the Australian Agricultural Economics, to which as number of AERU staff belonged both at that time and today, published its proceeding as AERU Discussion Papers. They included: Discussion Paper No. 119 (1988), *Papers Presented at the New Zealand Branch of Australian Agricultural Economics Society Conference, Blenheim, July 1987 – Volumes 1 and 2;* Discussion Paper No. 121 (1989), *Papers Presented at the New Zealand Branch of Australian Agricultural Economics Society Conference, Flock House, Bulls, July 1988 – Volumes 1 and 2;* Discussion Paper No. 125 (1989), *Papers Presented at the New Zealand Branch of Australian Agricultural Economics Society Conference, Flock House, Bulls, July 1989 – Volumes 1 and 2*; and Discussion Paper No. 131 (1991), *Papers Presented at the New Zealand Branch of Australian Agricultural Economics Society, Sixteenth Annual Conference*, Lincoln University, August , 1991.

In 1990, AERU Review Committee was disestablished. A major milestone for Lincoln during that year was its achievement of full university status, with Bruce Ross as the first Vice-Chancellor.

Above: AERU Staff under Tony Zwart,
c. 1991.

Source: AERU Promotional Publication, c. 1981.

2.4.2 Tony Zwart, 1987-1998: The Later Years (1992-1998 inclusive)

In the second half the decade in which Tony Zwart was Director, staff numbers remained low and the main role of the AERU continued to be as publishing vehicle for departmental research. However, the remaining staff members continued to obtain research contracts and publish their results as Research Reports and Discussion Papers. During 1994 the appearance of these research outputs was updated to present a more modern image.

Carolyn Morris wrote two Research Reports during this period. The first, Research Report No. 232 (1995), *Understanding Why Farmers Change Their Farming Practices: The Role of Orienting Principles in Technology Transfer*, co-authored by John Fairweather and Alison Loveridge, discussed the results of an of the farmers' reasons for adoption and non-adoption of new technologies. The differences in the drivers for adoption amongst differing groups of farmers were investigated. Sheep/beef farmers were found to emphasise profitability and the need for control, while dairy farmers emphasised increased production and achieving increased efficiency and control by monitoring production. Morris, Fairweather and Simon Swaffield jointly wrote Research Report No. 236 (1997), *Investigating Community: Imperatives For by Constraints Against Land Use Change in the Mackenzie/Waitaki Basin,* followed earlier AERU work on the economic and social impacts of land use in taking a broader view of the social context in which any land use changes would occur, examining the nature of communities, and the roles that community dynamics play in land use change.

Senior Research Sociologist John Fairweather continued to be a highly productive researcher and prolific author during this period. He contributed nine Research Reports during the period 1992-1997. In Research Report No. 213 (1992), *Agrarian Restructuring in New Zealand*, Fairweather described the changes that had occurred in New Zealand farming between 1984 and 1990, based on his analysis of data using from a wide range of sources. The research showed that, despite rapid exposure to international forces and a more-market economy, family farms in New Zealand had adapted and survived successfully. Research Report No. 215 (1992), *A Tree Model for Hawke's Bay Farmers' Tree Planting Decisions*, examined how farmers decide to plant trees, by developing decision tree models which accounted for key criteria in the decision making process. In Research Report No. 219 (1993), *Farming in Hurunui and Clutha Counties: Current Attitudes and Practices Compared to Survey Results in 1986,* Fairweather and Soraiya Gilmour updated earlier work on farm performance since deregulation (Research Report No. 187). A preliminary study of smallholders' perceptions of the rural lifestyle, and how perceptions change over time, was the subject of Research Report No. 220 (1993), *Intending Smallholders' and Existing Smallholders' Perceptions of the Rural Lifestyle around Christchurch, New Zealand.* In this report Fairweather found no evidence to support the hypothesis that smallholders were dissatisfied with their rural experience. The organisation of large-herd dairy farms was examined in Research Report No. 222 (1994), *Social Organisation of Large Herd Dairy Farms in New Zealand*, in which the author concluded that the increasing numbers of large dairy herds did not appear to be reducing access to farm ownership, and that the character of large herds farming supports meritocratic access to land. In Research Report No. 224 (1994), *Preferences for Land Use Options in the Mackenzie/Waitaki Basin,* Fairweather and Simon Swaffield (Professor of Landscape Architecture at Lincoln College), described an investigation of stakeholder preferences, conducted in order to develop feasible land use scenarios. Visual images, and the identification of several clear themes, or sets of preferences, such as plantations, grazing/trees, and conservation, were used to elicit stakeholder preferences.

Research Report No. 230 (1994) *New Zealand Agricultural Policy Reform and Impacts on the Farm Sector*, was co-written by Fairweather and two visiting researchers from Quebec, Daniel M. Gouin (Researcher with Groupe de recherché en économie et politique agricoles (GREPA) and Professor in the Département d'économie rurale of Université Laval, Québec) and Noëlla Jean (Agro-economist with the examines the-post-1984 agricultural restructuring in the context of the general evolution of New Zealand agriculture, presenting timeseries data that were collated from a wide range of sources. In Research Report No. 233 (1996), *The Decision Making of Organic and Conventional Agricultural Producers,* by Fairweather and Campbell, farmers' reasons for adoption or non-adoption of organic production techniques were examined. Analysis of the reasons for, and constraints on, decision making for organic and conventional agricultural producers resulted in the identification of five different motivations for growing organic products, including philosophy, consumer preference, personal health, high premiums or problems with conventional production. Further work on the Waitaki Basin by Fairweather, Caroline Morris and Simon Swaffield was the subject of Research Report No. 236 (1997) *Investigating Community: Imperatives for but Constraints against Land Use Change in the Mackenzie/Waitaki Basin*. This report presented a broad view of the social context in which land use changes would occur in this region, and examined the nature and dynamics of the community. In Discussion Paper No. 132 (1992), *Topics for Rural Social Research,* Fairweather identified a number of rural social topics that should be included in MAF's social research programme. He concluded that an appropriate research strategy would include the development of a rural database, supplemented by farm and community studies using the full array of social science methods.

Other Research Reports published by members of staff at this time included Research Report No. 216 (1992), *History of the New Zealand Milk Board: A Study of the Corporatist Alliance Between the State and the Domestic Milk Sector,* a report by Soraiya Gilmour on the history of the New Zealand Milk Board, which was analysed as a case study of statutory board set up to manage the post-war agricultural economy. This work examined corporatist-structured industries in the context of broader global economic trends of restructuring, institutional experimentation, and economic integration. Research Report No. 217 (1992), *Changing Export Markets for New Zealand Sheepmeat 1983-1991* written by Lesley Storey examined international markets for lamb "which have been growing in the recent past and which might reasonably be expected to continue growing in the future". The characteristics of regional markets, including product mix, prices and future potential, were described to provide information for New Zealand sheepmeat marketers. A model, developed Glen Thompson during his masterate research, to quantify the future potential of New Zealand's lamb export market was the subject of Research Report No. 223 (1994), *A Forecasting Model of New Zealand's Lamb Exports.* Research Report No. 221 (1993), *Contingent Valuation of Improved Water Quality in the Lower Waimakariri River*, was co-written by Sheppard, Tessa Fergusson (AERU), Geoff Kerr (Centre for Resource Management) and Ross Cullen (Department of Economics and Marketing). The report described a practical application of the contingent valuation method to establish the perceived value of policy interventions that resulted in an improvement in water quality in the Lower Waimakariri River.

Lincoln University Department Staff also continued to publish their work with the AERU, including Peter Nuthall, now a Reader in the Farm Management Department, who was co-author of six Research Reports during the later period of Zwart's Directorship. Five of these, by Nuthall and G. Bishop-Hurley (Research Officer in the Farm Management Department) reported a series of studies, funded by AGMARDT, entitled "Expert Systems in Feed Management, a look into better feed budgeting techniques to produce higher stock carrying capacities". The first was Research Report No. 225 (1994), *Feed Management and Computer Practices on a Sample of New Zealand Farms,* which reported the results of a survey of

farmers to investigate their feed budgeting practices and their ownership and use of computers. The results showed that for feed budgeting to become more widely used, better information and software, and better and more extensive training opportunities would be required. Other papers in this series included Research Report No. 226 (1994), *An Expert System for Weaning Lambs,* which described a computerised approach, which incorporated expert opinion in the computer response process, to determining optimal lamb weaning dates. The authors suggested that mixed expert-system, calculation-based, systems warranted investigation. A mixed expert-system, calculation-based, system for determining optimal sheep drenching times was the subject of Research Report No. 227 (1994), *An Expert System for Sheep Drenching. The* authors acknowledged that the costs of developing a comprehensive health reference and integrated diagnostic system, which accounted for of the economics of treatment, would be high. Similar analyses of the use of expert systems of surplus feed allocation and feed management are described in Research Report No. 228 (1994), *An Expert System for Surplus Feed Allocation*, which and Research Report No. 229 (1994), *The Application of Expert System Methodology to Feed Management.* Nuthall's final Research Report during this period was Research Report No. 214 (1992), *Actual and Potential Computer Use By A Group of Primary Producers*. In this the results of a survey conducted by the Kellogg Farm Management Unit to identify the level and type of computer use by rural businesses, particularly farmers, were discussed. The research indicated that there was an increasing need for the provision of education and training opportunities for existing computer users and those yet to adopt computer technology.

Publications by the staff of other Lincoln University Departments included Research Report No. 212 (1992), *The New Zealand Consumer Market for Cut Flowers in the '90s*, by Charles G. Lamb (Senior Lecturer in Marketing at Lincoln University), Dennis J. Farr (Lecturer in the Department of Horticulture at Lincoln University), and Patrick McCartin (ex-AERU staff member, now a self—employed computer consultant). In this report the results of a survey conducted (by the Marketing Group of the Department of Economics and Marketing at Lincoln University) to determine the demand for commercial cut flower, were discussed. Research Report No. 231 (1995), *New Zealand's International Trade Performance, Pre and Post Deregulation: 1970-1985 and 1985-1993,* by Ralph Lattimore and Paul McKeown (Tutor in Economics), presented an overview of New Zealand's trade situation with reference to other studies of trade patterns that had been undertaken at Lincoln University. The authors concluded that although New Zealand's trade had grown more slowly than world trade over the entire period, but the proportionate difference had declined after 1985. Geoff Butcher (Department of Agricultural Economics) reported the results of an input-output analysis of the regional impacts of forestry development in the Mackenzie/Waitaki Basin in Research Report No. 235 (1997), *Regional Income and Employment Impacts of Farming and Forestry in the Mackenzie/Waitaki Basin*. This work showed that forestry expansion in the region was likely but would result in only small changes to regional employment, since the preferred land for forestry development was of low livestock carrying capacity.

Another example of work undertaken by AERU visitors, on New Zealand farming post-deregulation, was written by Rudolf Helbling (Doctorate student, University of St Gallen, Switzerland). In Research Report No. 234 (1996), *Family Farming without State Intervention: Economic Factors Underlying the Prevalence of Family Farming – Theoretical Analysis and Case Study of New Zealand*, Hebling examined the place of the family farm in New Zealand agriculture, and the economic factors underlying its success in the absence of subsidies. He argued that the requisites for the survival of the family farm in a setting without state intervention are not unique to New Zealand, and concluded that the family farm would probably persist, and possibly dominate other modern agricultures, without state intervention.

Fewer Discussion Papers were published during this period than during the first half of the Zwart era. Ron Sheppard was the author of Discussion Paper No. 135 (1993), *New Zealand Agricultural Policy Change: Some Effects,* in which the progress of the agricultural sector and its reaction to Government policies which have affected it were analysed, in order to provide a perspective for future developments. Sheppard and Catherine Atkins were joint authors of Discussion Paper No. 140 (1994), *Dumping, Protectionism and Free Trade*, which was the text of an address delivered to the General Meeting/Seminar of the Importers Institute held in Auckland in 1994. The paper presented a brief review of the theoretical basis for anti-dumping actions; examined the concept of discriminatory pricing; discussed the effect on the economy of anti-dumping actions, and described a recent example of anti-dumping action in New Zealand.

Discussion Paper No. 139 (1994), *Classifying New Zealand's Export Markets: A Behavioural Approach,* written by Glen Thomson and Ralph Lattimore, suggested that a suitable approach to grouping markets may be to use behavioural segmentation to classify countries into markets, using cluster analysis based on a number of key market characteristics.

Discussion Papers written by staff members of other departments during this period included Discussion Paper No. 134 (1992), *Capital Budgeting and Policy Evaluation using Option Pricing Theory*, which in Peter Seed (Accounting and Valuation Department) explained the potential uses, advantages and problems of option pricing theory in evaluating capital budgeting problems and contingent liabilities, in non-technical language.

Several researchers from other universities and government organisations also published research results as AERU Discussion Papers during this time. Rodolfo M. Nayga, Jnr and Daniel B. Waggoner (Lecturer and Assistant Lecturer, respectively, Department of Agricultural Economics and Business, Massey University, Palmerston North), wrote Discussion Paper No. 137 (1994), *Competing in the Global Marketplace: Issues, Trends and Challenges Facing New Zealand's Sheepmeat Industry*, with financial support received from the AERU. They reviewed a wide range of issues affecting meat markets, with particular emphasis on sheepmeat markets, and concluded that export meat receipts could be improved by changing the orientation of the industry so that meat production is demand-driven and targets key niche markets, and by adding value through processing. Michael Lyne (Department of Agricultural Economics, University of Natal, Pietermaritzburg, South Africa – now Associate Professor in International Rural Development at Lincoln University) examined aspects of ownership and property rights of Maori land that have led to under-utilisation of land in Discussion Paper No. 138 (1994), *Ownership and Control of Maori Land: Some Lessons for South Africa*. The paper described methods by which the situation might be improved in New Zealand, highlighted the similarities between the New Zealand and South African situations, and recommended appropriate ways of dealing with the issues in South Africa, based on the New Zealand experience.

Discussion Paper No. 143 (1996), *The Implications of Government Reform in New Zealand for the Canadian Agri-Food Sector*, was a report on work undertaken by Gary Storey (on sabbatical from the University of Saskatchewan, Canada). Storey examined the impacts of managerial reform in government and economic on the development and delivery of economic and policy analysis in government and in industry in New Zealand. The paper, prepared to assist the federal government of Canada in its decisions regarding the future of the Policy Branch in its agricultural ministry, Agriculture and Agri-Food Canada (AAFC), highlighted the issues of particular relevance to the reform and privatization of activities traditionally supplied by the Canadian government.

The proceedings of the New Zealand Branch of the Australian Agricultural Economics Society, which became the New Zealand Agricultural Economics Society in 1993, continued to be published as AERU Discussion papers. These included Discussion Paper No. 133 (1992), *Papers Presented at the New Zealand Branch of Australian Agricultural Economics Society, Seventeenth Annual Conference*; Discussion Paper No. 136 (1993), *Papers Presented at the Eighteenth Annual Conference of the New Zealand Branch of Australian Agricultural Economics Society, Blenheim, July 1993,* Discussion Paper No. 141 (1994), *Papers Presented at the New Zealand Agricultural Economics Society, First Annual Conference (Blenheim Country Lodge, July 1994*; Discussion Paper No. 142 (1995), *Papers Presented at the New Zealand Agricultural Economics Society, Second Annual Conference: Agriculture and the Environment,* incorporating the 20th Annual Conference of the NZ Branch of the Australian Agricultural Economics Society; Discussion Paper No. 144 (1996), *Papers Presented at the New Zealand Agricultural Economics Society, Third Annual Conference: "New Zealand Agriculture in the 21st Century"*; and Discussion Paper No. 145 (1997), *Papers Presented at the New Zealand Agricultural Economics Society, Fourth Annual Conference: "Managing Change in a Dynamic Environment"*.

Tony Zwart resigned as Director of the AERU in 1998, when he was appointed Director of the newly formed School of Professional Studies at Lincoln University.

2.4.3 Ross Cullen: 1998-2001

In 1998, when resource economist Ross Cullen (Senior Lecturer in the Department of Agricultural Economics and Marketing) took over the position of Director, the staff of the AERU comprised only John Fairweather, Glen Greer, whose work was largely published by clients or unpublished, and Secretary Ann Christie. Cullen's other responsibilities meant that his role as AERU Director accounted for only a small proportion of his time.

Above: Ross Cullen, c. 2001.

Source: Lincoln University Photo Archive.

Cullen co-authored two Research Reports during his time as AERU Director. MAF-funded research, which examined potential approaches to internalising the environmental externalities associated with commercial fisheries, was the subject of both of these and both were written by Cullen, Ken Hughey, Geoff Kerr and Ali Memon (of the Environmental Management Group, Lincoln University). Research Report No. 242 (2000), *Instruments for Internalising the Environmental Externalities in Commercial Fisheries,* examined the potential contribution of Environmental Impact Assessment techniques in identifying the significant externalities that occur in commercial fishing. It described a broad range of instruments that might be used in internalising fisheries externalities. Research Report No. 250 (2000), *Criteria to Evaluate the Application of Policy Instrument Designed to Internalise Externalities from Commercial Fisheries,* set out the criteria used to rank the instruments listed in Research Report No. 242, and described a Decision Support System developed to aid fisheries managers' select internalisation instruments.

Qualitative research projects undertaken by Senior Research Officer John Fairweather were reported in twelve Research Reports during Cullen's time as Director. In Research Report No. 238 (1998), *The Development of Organic Horticultural Exports in New Zealand*, John Fairweather and Hugh Campbell summarised the findings of four regional studies of organic horticulture in Bay of Plenty, Canterbury, Gisborne, and Nelson and Golden Bay, and answered key questions about the industry. They identified potential pathways for optimum

development of organic exporting, discussing important issues including reduction of "distance" and technical barriers, attainment of critical mass, and securing product integrity. Research Report No. 241 (1999), co-written with Simon Swaffield, *Public Perceptions of Natural and Modified Landscapes of the Coromandel Peninsula, New Zealand,* documented how members of the public defined both natural and modified landscapes, based on their responses to photographic images.

At this time Fairweather and Hugh Campbell, who had already completed several projects on organic farming, also turned their attentions to the increasingly controversial subject of genetic engineering. Two reports were based on the results of a survey of farmers to gather information on their attitudes towards, and intentions to adopt, GE technology and organic production systems. Research Report No. 243 (2000), *New Zealand Farmer and Grower Intentions to Use Genetic Engineering Technology and Organic Production Methods*, by authors John Fairweather, Andrew Cook and Hugh Campbell, examined the intentions of survey participants with respect to the adoption of these technologies, and explored the influences and relationships that have a direct bearing on their use of gene technology, purchases of GM food and use of organic methods. Research Report No. 251 (2001), *Environmental Beliefs and Farm Practices of New Zealand Organic, Conventional and GE Intending Farmers*, co-written by Fairweather and Campbell, Craig Tomlinson and Andrew Cook, investigated the differences in environmental values, farming practices, and views on the consequences of each farming technique held by organic farmers, conventional farmers and those who intended to use gene technologies when they became available. In a related paper, Research Report No. 253 (2001), *Research on the Consequences of Converting to Organic Production: A Review of International Literature and Outline of a Research Design for New Zealand,* Fairweather and Campbell reviewed the international literature on the outcomes from organic conversion in order to develop an optimum design for an organic farm conversion study in New Zealand. They found that, at that time, studies had been limited to longitudinal research on organic farms only, and static comparative studies between organic and conventional farms. They advocated the Before-After-Control-Intervention (BACI) design to examine different panels of farms over time that was later be used in a large research programme, funded by the Foundation for Research, Science and Technology and known as the ARGOS programme, in which the AERU, collaborated with Otago University and the Agribusiness Group for a number of years

Fairweather was also involved in several studies of land use change and its consequences during this period, particularly in relation to the East Coast of the North Island. In Research Report No. 245 (2000), *Smallholders in Canterbury: Characteristics, Motivations*, *Land Use and Intentions to Move,* commissioned by Environment Canterbury, Fairweather and Nicola Robertson reported the results of a survey of small land holders near Christchurch, conducted to provide information on the general characteristics and intentions of smallholders and smallholdings near Christchurch. Two studies of land use change between forestry and agriculture on the East Coast of New Zealand were carried out by Fairweather, Peter Mayell and Simon Swaffield. In the first, Research Report No. 246 (2000), *A Comparison of the Employment Generated by Forestry and Agriculture in New Zealand*, the authors assessed land use change in forestry and agriculture nationally, and in the main regions of New Zealand, and examined the relationship of land use to employment and other socio-economic factors. They found marked differences between the East Coast of the North Island and the rest of New Zealand in terms of these relationships, which could be expected to influence the location and nature of rural population change and community development. In the second, Research Report No. 247 (2000) *Forestry and Agriculture on the New Zealand East Coast: Socio-Economic Characteristics Associated with Land Use Change*, they examined differences in employment levels and other socio-economic indicators between forestry and

agriculture on the East Coast of the North Island between the 1970s and 1991. They found that areas with high levels of forestry generally showed a greater decline in indicators of economic wellbeing than areas with more agricultural activity. The region had experienced a decline in the numbers of young people and in the number of fulltime jobs, although education achievement and qualifications had improved. Research Report No. 248 (2000), *Community Perception of Forest Sector Development on the New Zealand East Coast: Likely and Acceptable Employment Activities, Infrastructure and Landscape Change,* examined the differences in community expectations of proposed land use change. The final report in this series, Research Report No. 249 (2000), *Gisborne/East Coast Field Research on Attitudes to Land Use Change: An Analysis of Impediments to Forest Sector Development,* by Fairweather, Craig Tomlinson and Simon Swaffield, described an ethnographic study conducted in Gisborne and East Coast region of New Zealand between May and September 2000. The research was carried to determine community attitudes to changes in land use from farming to forestry, and was undertaken because the forest sector development, of recent years appeared to have been hindered by infrastructure and employment issues. The community was found to be concerned about impacts of forestry development on local infrastructure, social and economic impacts on rural and urban communities, and environmental issues. The authors found political tensions within and between local forestry sector stakeholders; lack of support for, and confidence in, forestry by people who had little or no influence in the decision-making processes; a lack of a capable and willing forestry workforce in the region; and a community in which many doubted the region's ability to adapt to forestry. In Research Report No. 244 (2000), *Success Factors in New Land-Based Industries,* by Fairweather and Mayell, identified critical factors in industry success using the Qualitative Comparative Analysis method which combined a qualitative case study approach with the rigour of comparative analysis.

Fairweather's final report during this period which he co-authored with Diana Jackson, Craig Tomlinson and Ivan Donaldson was investigating a completely different subject. Research Report No. 252 (2001), *An Assessment of the Economic Costs of Relapsing-Remitting Multiple Sclerosis in the Canterbury/Westland Region of New Zealand,* reported a "cost-of-illness" study that estimated the potential economic costs of relapsing/remitting multiple sclerosis to the sufferers, their supporters, and the government. Overall they found that the Government paid about one third of all costs associated with multiple sclerosis, and that just over one in five sufferers did not receive any form of government assistance. The proportion of total costs met by Government was highest for those who had had the illness for longest.

Other Research Reports published by AERU at this time included Research Report No. 239 (1998), *A New Zealand Trade Share Database, 1966-1996,* by Selim Cagatay and Ralph Lattimore (then Professor of International Trade Policy at Lincoln University), which was a statistical publication documenting New Zealand's market share in export markets over a 31-year period (1966-1996). Overseas visitor Dr Kazuaki Araki (Hokkaido, Japan) wrote Research Report No. 237 (1998), *A Comparison of the Structure and Practice of Dairy Farming in New Zealand and Japan*, which compared structural factors and on-farm practices associated with dairy farming in New Zealand and Japan, highlighting significant differences in land and cow systems. Dr Jahangir Alam (Chief Scientific Officer and Head of the Economics and Marketing Division of the Bangladesh Livestock Research Institute), received funding from the World Bank to undertake a post-doctoral study at Lincoln, which was published as Research Report No. 240 (1999), *A Review of Economic Reforms in Bangladesh and New Zealand, and Their Impact on Agriculture.* This study was one of several undertaken at different times by international visitors, examining the impacts of the agricultural reforms in New Zealand. The author used the New Zealand experience to estimate the likely effects of reform of agricultural policy in Bangladesh.

Discussion Papers published during this time were limited to the proceedings of the New Zealand Agricultural and Resource Economics Society conferences, and included Discussion Paper No. 146 (1998), *Papers Presented at the New Zealand Agricultural and Resource Economics Society, Fifth Annual Conference: "Private vs. Public Interests – The Role of The State in Agriculture"*; Discussion Paper No. 147 (2000), *Papers Presented at the New Zealand Agricultural and Resource Economics Society, Sixth Annual Conference: "Where From – Where To?";* and Discussion Paper No. 148 (2001), *Papers Presented at the New Zealand Agricultural and Resources Economics Society, Seventh Annual Conference: "Where From – Where To?"*

In early 2001, former AERU Director Sir James Stewart ended his direct ties with Lincoln University after fifty years of involvement, retiring from the Board of Lincoln University Holdings, the umbrella company for the university's trading companies.

2.5 AERU Nowadays (Caroline Saunders) (2001-Present)

2.5.1 Caroline Saunders: The Early Years (2001-2006 inclusive)

In mid-2001, Ross Cullen resigned as AERU Director of the AERU to focus on other commitments in the Commerce Division at Lincoln University, and Caroline Saunders, Professor of Trade and Environmental Economics, was appointed to the role. Caroline Saunders was (and is) a member of the Council of the Royal Society of New Zealand, an advisory board member of the National Centre on Research on Europe, and a former Director of AgriQuality New Zealand. In 2001 she was elected President of the New Zealand Association of Economists (NZAE) and she was named as NZIER Economist of the year in 2007. Saunders was made an Officer of the New Zealand Order of Merit in 2009 for services to agriculture.

Above: Caroline Saunders, c. 2009.

Source: Lincoln University Photo Archive.

With Saunders as Director, the size of the AERU staff has increased to the levels of the early 1980s. Although the permanent staff is not large, staff numbers have been bolstered by many Research Assistants, Post-Graduate and Post-Doctoral Fellows, international postgraduate students and visiting researchers during Saunders' directorship, particularly in later years. The research output during this time, published both as AERU publications and in a diverse range of journals, conference proceedings, publications by other organisations and client reports has reflected the diverse interests of clients, staff and visitors.

In 2001, when Saunders took over the AERU staff consisted of John Fairweather, Glen Greer, and Post-Doctoral Fellow, Andrew Cook. Professor Paul Dalziel began his involvement with the AERU in 2002, when Saunders invited him to take part in a research project for the Ministry of Economic Development on regional economic development planning. In 2003 Paul was seconded to the Unit for a third of his time and this was increased to two-thirds in 2007, when he was part of a team that received funding of $2.1 million for a five-year research programme on education employment linkages for young New Zealanders. Post-Doctoral Fellows Lesley Hunt and Fiona Coyle joined the AERU social team in 2003. Lesley Hunt was subsequently employed as a Research Officer and

remains on the AERU staff, while Coyle left at the end of 2004. Research Associate Anita Wreford joined the staff for three years between 2003 and 2006 during which time she completed her PhD studies, and Research Associate Martin Emanuelsson was employed from late 2004 to early 2006. PhD Candidate Selim Catagay (now Professor of Economics at Hacettepe Universitesi, Turkey) was employed as a Research Officer for two periods in 2008 and 2010.

Saunders was (and is) a very "hands-on" Director, a very active researcher, and in high demand as a speaker at an extremely diverse range of events. On her appointment as AERU director she gave up most of her teaching responsibilities in the Commerce Division to focus on the re-establishment of the AERU as a leading organisation in the provision of economics research and consultancy services. She has extended the range of work undertaken by the AERU into new areas that include sustainable farming systems, trade modelling and economic development, to reflect the changes in agricultural sector and national priorities

Sustainable resource use by the primary sector, a key objective set by the New Zealand Ministry for Primary Industries (MPI), is an area of national importance that has been included on the AERU research agenda during Saunders became Director. A major initiative in this area was the establishment, in October 2003, of the Agriculture Research Group (ARGOS). ARGOS is a joint research venture between The Agribusiness Group, Lincoln University (AERU) and University of Otago (Centre for Agriculture Food and the Environment (CSAFE)). ARGOS is funded by the Foundation for Research, Science and Technology (FoRST) and a number of industry stakeholders. The programme's mandate is to examine the environmental, social and economic sustainability of New Zealand farming systems, and its general goal is to facilitate innovation and improved performance in primary production systems. The initial FoRST funding was for six years, but ARGOS is intended to be a 20 to 30 year programme involving long-term monitoring of a wide range of economic, social and environmental indicators on sheep and beef farms, high country farms, kiwifruit orchards, and later dairy farms. The range of other activities that have been undertaken have included an international market watch and work on carbon footprinting. The ARGOS programme has been described as one of the largest farm-level agricultural sustainability research projects in the world. AERU and ARGOS researcher Lesley Hunt observed that "In order to implement environmental policies for sustainable and resilient land use, we need to better understand how people relate to their agricultural land and how this affects their practices." Enhancing this understanding has been a key objective of ARGOS.

Saunders' own research, and that of many postgraduate fellows and research associates, has resulted in the development and extensive use of the Lincoln Trade and the Environment Model (LTEM), which has been used to investigate the impacts of a range of trade and environmental policies on New Zealand's primary sector. Research Report No. 254 (2003), *Lincoln Trade and Environment Model (LTEM): An Agricultural Multi-Country, Multi-Commodity Partial Equilibrium Framework,* by Saunders and Selim Cagatay, described the theoretical and technical specifications of the LTEM; identified a range of policies that could be incorporated into the LTEM; outlined the model interactions; and described the simulation approach to modelling policy changes or other shocks. Other reports based on LTEM simulations include Research Report No. 261 (2003), *Economic Impacts on New Zealand of GM Crops: Result from Partial Equilibrium Modelling,* co-written by Saunders, Bill Kaye-Blake and Selim Cagatay, which examined the expected impacts on New Zealand producer returns from the adoption of genetically modified (GM) food crops. The results showed that consumer preferences were (by far) the most important influence on producer returns in New Zealand, that increasing productivity is not necessary to increase producer returns, and that increased supply may lead to lower returns. The work of Saunders and other AERU staff on

the impacts of genetic engineering, particularly at the time of the Royal Commission on Genetic Modification in 2000/2001 when there was controversy regarding New Zealand's approach to the adoption of GM technology, was subject of considerable media attention.

Other studies that involved the use of the LTEM included the modification of the LTEM to incorporate the environmental consequences of different production systems. This was undertaken to facilitate modelling of the impact of changes in trade policy and/or changes in environmental policy on trade and/or on the environment, and described in Research Report No. 263 (2003), *Lincoln Trade and Environmental Model (LTEM): Linking Trade and Environment,* written by Saunders, Catagay and Anita Wreford. Research Report No. 267 (2004), *Trade and Environment: Economic and Environmental Impacts of Global Dairy Trade Liberalisation,* written by Saunders, Cagatay and Andrew Moxey (Economic Advisor, Scottish Executive), described research that incorporated the effects of dairy production systems on water quality into a partial equilibrium model of international trade in dairy products (LTEM). The model was used to simulate the effects of liberalisation policies on trade flows, dairy production systems and groundwater nitrate levels in different countries. The results showed unequal changes in groundwater quality between and within countries. More specifically, while trade liberalisation can be expected to lower EU dairy production and to reduce nitrate pollution in the EU slightly, the balancing increases in production elsewhere would lead to marginally higher pollution in other countries. This was of policy relevance given contemporary debates about the likely net environmental effect of further trade liberalisation. In Research Report No. 270 (2004), *Modelling the Trade Impacts of Willingness to Pay for Genetically Modified Food*, Saunders, Kaye-Blake and Fairweather described the results of incorporating survey-derived consumer attitudes to GM food crops into LTEM, in order to assess the impacts of consumer preferences on farm profitability. The consumer indifference to, or rejection of, GM foods identified by the survey was shown to limit the profitability of GM crop production in New Zealand. These reports reflected the new direction of the AERU, incorporating the concepts of sustainability, ethical foods and environmental attributes into the evaluation of market structure and trends.

A landmark study examining the energy required to produce and transport a range of New Zealand's primary products to export markets is described in Research Report No. 285 (2006), *Food Miles – Comparative Energy/Emissions Performance of New Zealand's Agriculture Industry*. This research, by Saunders, Andrew Barber (the Agribusiness Group) and Greg Taylor (AERU associate) examined the relevance of the concept of "food miles" (a measure of the distance food travels from producer to consumer), a sustainability measure that was gaining wide acceptance as a measure of the environmental impacts, including greenhouse gas emissions and energy consumption, of food production. Saunders et al. demonstrated that a more appropriate approach to comparing the environmental impacts of food products from different sources is analysis of the total energy used, and emissions produced, in food production and transport from "paddock to plate". They showed that, despite the long distances involved in shipping products from New Zealand to the United Kingdom, New Zealand's main primary exports used less energy and generated lower emissions in production and transport than similar products produced in the United Kingdom. This is a reflection of New Zealand's lower-energy production systems. On a per-tonne basis, New Zealand dairy production was shown to be at least twice as efficient in energy and emissions terms than competing United Kingdom products, while New Zealand sheepmeat production was shown to be four times as efficient. The "food miles" report attracted world-wide attention, and was the subject of a special report in The Economist. As result, Saunders was deluged with requests for interviews, articles and presentations.

During her early years in the AERU, Saunders collaborated with other members of staff in research on aspects of regional development and a wide range of farming sector issues. Regional development studies included an analysis of the economic background, natural resources and physical infrastructure of North Canterbury. Carried out by Tracy-Anne Cross (Lecturer Commerce Division) and Paul Dalziel (Professor of Economics) and Saunders, this research was the subject of Research Report No. 255 (2003), *North Canterbury: An Analysis of the Current Economic Base of the Region*, and had been commissioned by Enterprise North Canterbury. Research Report No. 260 (2003), *The High-Tech Sector in Canterbury: A Study of its Potential and Constraints*, described the current and potential contributions of the high-tech sector to the Canterbury and New Zealand economies. This research was co-written by Saunders and Dalziel, and commissioned by Industry New Zealand (now New Zealand Trade and Industry). The key factors that influenced the development of the hi-tech sector in Canterbury were identified and approaches to ensuring that the sector achieved its full potential were recommended. A sequel to this report was published in 2006 as Research Report No. 288 *Forecast of Skills Demand in the High-Tech Sector in Canterbury: Phase Two*, by Dalziel, Saunders and Eva Zellman. This presented the results of a survey conducted to identify sector participants, document the current occupations of sector employees, predict the occupations of sector employees in future; and identify the skill requirements of the sector in future.

The subject of Research Report No. 279 (2005), *The Economic Contribution of Four Biotechnologies to New Zealand's Primary Sector*, co-written by Bill Kaye-Blake, Saunders, Martin Emanuelsson, Dalziel and Wreford, was a study conducted as part of a Government initiative to assess the current economic contribution of biotechnology to primary sector industries in New Zealand in quantitative terms. The analysis of four biotechnologies employed in the production and early stages of processing of primary products, including clonal propagation/cell manipulation; biocontrol agents, enzyme manipulation and marker-assisted selection, found that clonal propagation/cell manipulation was largest contributor at the time The Selwyn District Council commissioned Research Report No. 271 (2004), *Selwyn District Council,* by Cross, Dalziel and Saunders was an economic baseline report of the current level of resources in the Selwyn District and the changes in this over time. It described the macro-economic and policy context; business sector, employment and population trends; and the natural resources and infrastructure of the district. Research Report No. 257 (2003), *Economic Analysis of Issues Concerning Organic Dairy Farming*, by Danish visitor Vivi Christensen and Saunders, reviewed international organic dairy production and consumption with particular focus on Denmark and New Zealand. The Danish experience was used to define scenarios for New Zealand. The LTEM was used to model the scenarios in order to estimate the returns to New Zealand producers that would be derived from a shift to organic production. The results demonstrated that there would be economic benefits from further organic conversion in the dairy industry.

Paul's work in the unit has concentrated on two main themes – regional economic development and regional skills ecosystems. This included four projects for the OECD as well as a series of reports and other publications out of the education employment linkages programme. He was President of the Australia and New Zealand Regional Science Association International from 2009 to 2011 (the first New Zealander to hold this position) and served on the Council of its parent body (RSAI) after 2011.

Much of John Fairweather's research during the early Saunders era was related to the new research theme of sustainability, and associated topics such as ethical foods and environmental attributes. Issues relating to the adoption of biotechnologies in New Zealand were the subject of extensive research by Fairweather and other members of AERU staff.

Public perception and acceptance of biotechnology was examined in a series of reports including Research Report No. 258 (2003), *Farmers' Views on the Use of Genetic Engineering in Agriculture,* co-written by Fairweather, Crystal Maslin, Peter Grossman and Hugh Campbell. Their research had examined farmers' attitudes towards the adoption of genetically engineered technologies (GE) in agriculture and to the adoption of organic production systems. They found that most farmers did not foresee that they would have significant problems on their farms that would require them to adopt these alternative production systems as a solution. The majority of farmers were neither strongly opposed to GMOs nor keen to adopt them. In a follow up report - Research Report No. 259 (2003), *Change in New Zealand Farmer and Grower Attitudes Towards Gene Technology: Results from a Follow Up Survey* – by Fairweather and Andrew Cook, the results of the earlier survey were compared with the results of a survey conducted in 2002. They found that there had been only minor changes in farmer attitudes to these issues during the intervening years. Research Report No. 268 (2004), *South Island Maori Perceptions of Biotechnology*, co-written by Mere Roberts and Fairweather, examined the attitudes of South Island Maori to biotechnology. Respondents were found to have a negative attitude to biotechnology because of a perceived risk that it would have negative impacts on human health, the environment, whakapapa, wairua, and mauri. Many respondents considered the technologies to be "not right" or a "fad". A range of factors were found to be contributing to this perception of risk, including lack of knowledge and information on which to make informed decisions, and distrust of science. The report included a number of policy recommendations. A review of these three reports, and of research conducted by other researchers, was presented in Research Report No. 269 (2004), *New Zealand Public Acceptance of Biotechnology.* The authors*,* Andrew Cook, John Fairweather, Theresa Satterfield and Lesley Hunt, concluded that there was a high level of public concern about biotechnology in New Zealand, and that entrenched negative attitudes may rule out the use of biotechnologies in future. Cook and Fairweather conducted a later survey of public attitudes to biosecurity in 2005, in order to examine attitudes in greater depth and to assess the extent of the changes that had occurred since 2002. Research Report No. 277 (2005) *New Zealanders and Biotechnology: Attitudes, Perceptions and Affective Reactions* reported that these attitudes differed according to the nature of the technology, and that the softening of attitudes to aspects of cloning and GM that had occurred during the period suggested that attitudes tend to be "resilient to change". Research Report No. 286 (2006), *The Influence of Perceptions of New Zealand Identity on Attitudes to Biotechnology,* by Lesley Hunt and Fairweather, re-examined survey data in order to explain the role of identity in peoples' reactions to biotechnology. They classified survey respondents into five groups according to their views on which key attributes defined the "New Zealand identity", and showed that these groups differed in their attitudes to biotechnology. These differences might also be expected to influence attitudes to other innovations, such as nanotechnology.

Issues surrounding the adoption of nanotechnology were also the subject of research by the AERU social researchers during this period. Research Report No. 281 (2005), *Nanotechnology – Ethical and Social Issues: Results from New Zealand Focus Groups,* co-written by Fairweather and Cook, presented the first New Zealand research on public reactions to nanotechnology which had been examined by means of focus groups and a national survey. They concluded that there was a need for social research that would inform and guide the development of nanotechnology, and develop processes for interaction between scientists, policymakers and the public that would minimise the risk of adverse public reactions. In Research Report No. 287 (2006), *New Zealander Reactions to the use of Biotechnology and Nanotechnology in Medicine, Farming and Food* Cook and Fairweather, investigated public reactions to possible new developments in biotechnology and nanotechnology and examined changes in the perceived acceptability of these technologies

over time. They showed that there had been some improvement in reactions towards biotechnology, and concluded that public acceptance was likely to continue to slowly improve over time, provided that no adverse impacts arose to cause a negative public reaction. The last report in this series by Fairweather and Cook was Research Report No. 289 (2006), *Nanotechnology – Ethical and Social Issues: Results from a New Zealand Survey*, which presented the results of survey research on reactions to a number of examples of nanotechnology. This research showed that, in general, there was more public concern about biotechnology than nanotechnology, and that reactions differed according to the demographic characteristics of respondents and the nature of the technology.

Fairweather's work during the early years of the Saunders era included several reports related to his earlier research themes of forestry, natural landscapes and smallholdings. Research Report No. 264 (2003), *Values and Management Options for Sustainable Forest Management in New Zealand,* co-written by Astrid Blackburn, Simon Swaffield and Barbara Hock, examined the perceptions held by forest industry participants of the meaning of "sustainable forest management. Stakeholders had different value orientations with respect to exotic and indigenous forestry, but most considered sustainable yield and multiple use to be more important than ecosystem management. Very few stakeholders believed that sustainable forest management to be impossible. Research Report No. 273 (2004), *Public Perceptions of Outstanding Natural Landscapes in the Auckland Region*, by Fairweather and Swaffield described the manner in which members of the public and key informants defined outstanding natural landscapes in the Auckland region. They found that he public evaluated natural landscapes in two distinctive ways. The largest group of those surveyed valued natural landscape most highly when there is no evidence of human presence, modification or management. The second group also valued many pristine environments, but also evaluated some types of modified environment as being outstanding natural landscapes. Research Report No. 278 (2005), *Characteristics of Smallholdings in New Zealand: Results from a Nationwide Survey*, co-written by Cook and Fairweather, reported the results of a nation-wide survey of smallholders conducted to examine landuse on smallholding, and the social and environmental effects of smallholding. The analysis showed that smallholders did not voluntarily engage in environmental monitoring and environmentally friendly practices to the same extent as other farmers and growers, and were less likely to adopt organic practices. However, a 'greening' of the landscape was predicted on the basis of smallholders' declared intentions of planting trees. Earlier work on smallholding in the Selwyn District (Research Report No. 278) was updated in Research Report No. 280 (2005), *Smallholding in the Selwyn District,* which examined in detail where smallholders work and shop, and where and how they identify with their rural community.

Senior Research Officer Glen Greer continued her research in the economic and policy analysis of primary sector issues. This included work on emerging industries in New Zealand that was published by the Ministry of Agriculture and Forestry, and a number of studies reported only in confidential client reports. Research Report No. 274 (2004), *The Costs of Footrot and the Impact of the Footrot Gene-Marker Test in New Zealand: A Report to the Sustainable Farming Fund*, estimated the costs of footrot to the fine-wool sector in New Zealand, and reported the results of a cost benefit analysis of the footrot gene-marker test developed at Lincoln University. Her involvement in work relating to the biosecurity and land management programmes of the Hawke's Bay Regional Council began at this time with Research Report No. 282 (2006), *The Economic Benefits of the Possum Control Area Programme.* This study used a variety of survey methods to estimate the impacts of possums in the Hawke's Bay region, and the benefits of the Possum Area Control Programme.

Post-Doctoral Fellow Fiona Coyle published two-part series of reports entitled *Public Understanding of Biotechnology in New Zealand* during 2003. Research Report No. 265 (2003), *Public Understanding of Biotechnology in New Zealand: Nature, Clean Green Image and Spirituality*, was co-written by Crystal Maslin, John Fairweather and Lesley Hunt, and presented the findings of a series of focus groups, held throughout New Zealand, to examine public perceptions of novel biotechnologies. In particular, this work examined the role of nature, New Zealand's "clean green" image, and spirituality in determining the acceptability of a series of recent innovations. The views of focus group members on the acceptability of five selected biotechnologies and the factors that participants considered when making their ranking decisions were examined in a parallel report, Research No. 266, (2003) *Public Understandings of Biotechnology in New Zealand: Factors Affecting Acceptability Rankings of Five Selected Biotechnologies,* written by Hunt, Fairweather and Coyle. In this report the manner in the participants' reactions to each of the selected biotechnologies manifest different aspects of six different themes is described and common factors across all biotechnologies were identified. This process demonstrated the importance of considering the acceptability of biotechnologies on a case by case basis.

Staff and students from other Lincoln University Departments and ex-AERU staffers continued to use the AERI as a publishing vehicle for their own research. Geoff Kerr (Department of Environmental Management), wrote two Research Reports on the non-market valuation of resources. Research Report No. 256 (2003), *Community Mitigation Preferences: A Choice Modelling Study of Auckland Streams,* co-written by Basil Sharp (University of Auckland) described the use of choice modelling to evaluate two mitigation options and the status quo for two degraded streams in the Auckland region. In this study the choice modelling technique was successfully applied to identify community willingness to trade-off stream attributes. The results showed that people were able to understand the choice game, were willing to consider the tradeoffs carefully and to make reasoned choices. It also demonstrated the value of the technique in assisting to design mitigation strategies to offset pollution in Auckland streams. Research Report No. 272 (2004), *Instream Water Values: Canterbury's Rakaia and Waimakariri Rivers*, was co-written by Kerr, Sharp and Ken Leathers (by then an Economic Consultant in Wellington). It reported an analysis of previously unpublished results from an earlier study of instream values associated with two Canterbury Rivers (the Waimakariri and the Rakaia). Several different approaches to estimating the recreational use benefits and non-use benefits from protection of instream flows and improving water quality in the Waimakariri River. The research showed that Canterbury residents placed a significant value on protection of instream amenities that "should not be ignored in contemporary water allocation decisions". Former Visiting Fellow Daniel M. Gouin summarised and updated the work he had undertaken in 1994 (Research Report No. 230) in Research Report No. 284 (2006), *Agricultural Sector Adjustment Following Removal of Government Subsidies in New Zealand.* Gouin concluded that the New Zealand farm sector had continued to maintain its level of economic activity despite the significant reductions in state support. Commerce Division staff members Minsoo Lee and Christopher Gan published research funded by the Canterbury Development Corporation into the trends and growth rates of foreign fee-paying (FFP) student numbers in the Christchurch-Canterbury region during the previous five years in Research Report No. 262 (2003), *Education Providers: A Qualitative Analysis of International Student Growth in Christchurch and Canterbury*. The research examined trends in both public and private teaching institutions, and provided forecasts of trends in FFP student numbers to 2007. Research Report No. 290 (2006), *Single Farm Payment in the European Union and Its Implications on New Zealand Dairy and Beef Trade*, by Klaus Kogler, examined the hypothesis that a higher degree of decoupling of direct payments would lead to lower production and lower EU exports, increasing the potential opportunities for New Zealand exports of dairy products. In

Research Report No. 276 (2005), *Management of Himalayan Tahr in New Zealand: High Country Farmer Perspectives and Implications,* Ken Hughey and Karen Wason (Department of Environmental Management) examined perceptions of the role and management of tahr in the New Zealand high country. They found that, while tahr are regarded as a pest by the Department of Conservation and some environmental NGOs, they are valued as a resource by farmers, recreationalists and other commercial interests, regionally and nationally. Consequently the authors concluded that tahr should be managed under an Integrated Animal Management regime involving an inter-agency approach, rather than treated simply as a pest.

Outside researchers also used the AERU as a publication vehicle on occasion. W.V. Parr and J.A. Green (Marlborough Wine Research Centre NZ, Lincoln University) and Geoffrey White (University of Otago), wrote Research Report No. 275 (2005), *Wine Judging, Context and New Zealand Sauvignon Blanc*, as featured in *Revue europeenne de psychologie appliqué*, which examined issues of consistency in independent wine judging, and the implications of these for New Zealand sauvignon blanc. In Research Report No. 283 (2006), *Maramataka: The Maori Moon Calendar*, a collation of 43 published and unpublished maramataka from various tribal sources Mere Roberts, Frank Weko and Liliana Clarke (of the Matauranga Maori and Bio Protection Research Team and the National Centre for Advanced Bio-Protection Technologies), presented a preliminary analysis of the origin of the moon night. They suggested a rationale for the sequential grouping of these names according to the phases of the moon.

Although the publication of Discussion Papers continued until 2011, they comprised only conference proceedings including Discussion Paper No. 149 (2002), *Papers Presented at the New Zealand Agricultural and Resource Economics Society, Eighth Annual Conference: "New Zealand – The International Citizen?"*; Discussion Paper No. 150 (2003), *Papers Presented at the New Zealand Agricultural and Resource Economics Society, Ninth Annual Conference*; Discussion Paper No. 151 (2004), *Papers Presented at the New Zealand Agricultural and Resource Economics Society, Tenth Annual Conference*; and Discussion Paper No. 152 (2005), *Papers Presented at the New Zealand Agricultural and Resource Economics Society, Eleventh Annual Conference*.

2.5.2 Caroline Saunders: The Present Day (2007-2011)

The scope of AERU research has continued to expand in recent years and the range of clients to diversify. There have been some changes in the permanent staff of the AERU, and a large number of Research Associates and Research Assistants, postgraduate students and visitors have stayed for varying lengths of time. John Fairweather, Principal Research Officer, continued his research in the AERU until his retirement in 2011, and in 2010 he was appointed as Professor of Rural Sociology, in recognition of his work. His appointment is believed to have been the first New Zealand professorship in rural sociology in New Zealand. It was also the first time an AERU staff member has been promoted to professor within the AERU. Glen Greer, Senior Research Officer and Lesley Hunt, Research Officer have both remained on staff to the present time. Bill Kaye-Blake, who had first joined the AERU as a Research Associate in 2005, was promoted to Senior Research Officer in 2008 and accepted the newly established position as Deputy Director in 2009. He remained in that position until his resignation to take up a position with NZIER in 2011. Paul Dalziel who had joined the AERU on a full-time basis in 2009, took over the position of Deputy Director on Kaye-Blake's resignation.

Research Officer Simon Lambert, now Lecturer in the Division of Environment, Society and Design, was employed in the AERU between 2008 and the end of 2010, and Senior Research Officer Jane Higgins has worked part-time in the AERU between 2009 and the present.

Senior Research Officer Patrick O'Neil has been employed by the AERU since 2011. Research Associates during the last five years have included Eva Zellman (2006 to early 2008); Rachel Campbell (2009 to 2011), Meike Guenther (2008 to present, now Junior Research Fellow; Tiffany Rinne, a Fulbright New Zealand scholar (2009 to 2012), Lars-Christian Sorensen (2008 to 2009) and Komathi Kolandai and Esnes Grey, (both 2008-2009). Emeritus Professor Tony Zwart and Mark Ward (former CEO, Plant and Food Research) have both worked on AERU projects during recent years. Teresa Cunningham has been the AERU Administrator and Director's PA since 2005, assisted by Karin Wintergerst during 2010, and Christine Lyne has provided accountancy services from 2009 to 2012.

There have been many Research Assistants during these years and unfortunately the records of some of these are not available. AERU Research Assistants during the later Saunders years have included Oliver Black, Ross Bowmar, Victoria Dowsing, Justin Esnes, George Gibb, Peter Hayes, McLeish Martin, Tawhai Matunga, Belinda Mortlock, and Hayley Neil and Chris Parsonson-Ensor, Paul Rutherford, John Saunders and Tim Driver currently hold this position. Sini Miller, Tremayne Barr and David Liu are PhD candidates currently undertaking their research in the Unit, and a number of other overseas students have undertaken research in the AERU

In 2009 the University agreed that the Staff Club premises would be moved and The Lodge (formerly the Principal's residence) altered to meet the AERU's need for a permanent base with an appropriate reception area. For the first time in several years all AERU staff could be located in the same building. In 2011 the AERU ceased to be part of the Commerce Division and became an independent research centre.

SPRINGTIME AT LINCOLN. *(from left)* THE LIBRARY, THE PRINCIPAL'S HOUSE AND IVY HALL

Above: Lincoln University outlook circa 1964 depicting (Left to Right): The Lincoln University Library (currently housing The Lincoln University Bookshop), The Principal's House (currently called The Lodge, housing the AERU), Ivey Hall (currently housing the George Memorial Library) and Memorial Hall (currently undergoing reconstruction).

Source: Lincoln University Calendar, 1964.

Director Caroline Saunders has remained a prolific author, although her outside commitments have increased in recent times. As well as a large number of external publications she has co-authored several research reports. In Research Report No. 294 (2007), J.D. Santiago Albuquerque (visiting from the EU Commission) and Saunders reviewed the European Union (EU) position on the World Trade Organisation (WTO) and its implications for New Zealand. Three tariff reduction scenarios were evaluated using the LTEM to estimate the impacts of different levels and forms of tariff cuts. This analysis showed that producer returns in the EU would decline in direct proportion to the magnitude of the tariff cut, while New Zealand and Australian producers would benefit under all the tariff reduction scenarios. In the EU reductions would be greater for sheep and beef producers than for dairy producers, since reductions in dairy production were expected to be lower.

Research Report No. 297 (2007), *Energy and Greenhouse Gas Emissions of New Zealand's and the UK's Dairy Industry,* described a comparison of emissions production and energy use by the dairy industries of New Zealand and the United Kingdom. This was an extension of the "food miles" research by Saunders and Barber that had been so widely acclaimed in 2006. In this subsequent research, greenhouse gas emissions (methane and nitrous oxide) were included in the analysis in addition to the emissions associated with energy use that had been included in the original analysis. With these inclusions, the emissions in generated by the dairy industry in the United Kingdom were estimated to be 34 percent higher per kilogram of milk solids and 30 percent higher hectare than those generated by New Zealand dairy production, even where the emissions associated with shipping were included. Work in this area was continued in response to a proposal by the Soil Association, a leading UK organic certifier, to make air-freighted organic produce ineligible for organic certification. The International Trade Centre commissioned Saunders and Peter Hayes to prepare Research Report No. 299 (2007), *Air Freight Transport of Fresh Fruit and Vegetables*, a review of the

literature dealing with food miles, particularly of studies on air freight transport of fresh fruit and vegetables. They found that, although air freight has a higher emissions profile than other forms of transportation, studies showed that the emissions associated with air transport generally comprise only a minor part of the total emissions produced during the lifecycle of fresh fruit and vegetables.

Research Report No. 296 (2007), *Preliminary Economic Evaluation of Biopharming in New Zealand,* co-written with Bill Kaye-Blake and Louise Ferguson, measured the social and economic impacts of biopharming in New Zealand. Their analysis showed that the potential profitability of biopharming enterprises is highly variable. The extent of the potential benefits depends on the overall size of the market, the control of technology or proprietary information, and a number of other factors. AERU work on biopharming was continued by Saunders and Kaye Blake and (a visiting researcher from Embrapa Beef Cattle, Radovi, Brazil), who used the LTEM to model the potential impacts of adopting biopharming technologies on New Zealand agriculture. Research Report No. 307 (2008), *Potential Impacts of Biopharming on New Zealand: Results from the Lincoln Trade and Environment Model*, also continued the series of AERU reports that have examined the results of modelling the impacts of technological or policy changes that affect international trade in agricultural commodities. It was concluded that the impacts of biopharming on the returns to agricultural production would depend not only on the relative values of the increase in revenues and the costs of implementation , but also on consumer perceptions about products produced using these technologies.

A description of the methodology used to expand the LTEM to include forest production and results from subsequent analysis was published as Research Report No. 316 (2009) *Modelling Climate Change Impacts on Agriculture and Forestry with the Extended LTEM (Lincoln Trade and Environment Model)*, by Saunders, Kaye-Blake and James Turner. In Research Report No. 317 (2009), *Economic Strategy Issues for the New Zealand Region in the Global Economy*, Saunders, Dalziel and Bill Kaye-Blake, identified key economic strategy issues for New Zealand, which they had analysed in the context of New Zealand's position in the global economy. They reported that an economy's capacity to respond to international market opportunities is determined by its levels of six major types of capital (physical, financial, human, natural, social and cultural). They stressed the importance of paying particular attention to the country's core export sectors to ensure that they are internationally competitive in formulating a national economic strategy, since these sectors generate incomes that fuel domestic demand.

Research Report No. 319 (2010), *Sustainability Trends in Key Overseas Markets: Market Drivers and Implications to Increase Value for New Zealand Exports*, co-written by Saunders, Meike Guenther (Research Associate) and Tim Driver (Research Assistant), examined the implications for New Zealand food producing industries of the increasing requirement to demonstrate sustainable production and processing technologies. A similar Research Report published in 2011, Research Report No. 324, *Enhancing Value for New Zealand Farmers by Improving the Value Chain* by Saunders, Hugh McDonald and Driver, described the international context in which New Zealand trades it agricultural exports and identified some potential opportunities for New Zealand farmers to increase returns for their products by ensuring that the attributes of New Zealand products attributes that consumers are recognised in the market place. New Zealand industries should concentrate on the attributes for which overseas consumers are willing to pay, and ensure that the value of these is captured and transmitted down the value chain.

Deputy Director, Bill Kaye-Blake, was the primary author of five Research Reports during this time, including Research Report No. 302 (2008), *A Bioeconomic Model of Californian*

Thistle in New Zealand Sheep Farming, which was co-written by Bhubaneswor Dhakal. This report described the use of a bioeconomic model of weed growth and control to estimate the economic value of biocontrol of Californian thistle to New Zealand sheep producers. The study demonstrated the value of bioeconomic modelling as a means of analysing agricultural production systems, and identified important gaps in the information available on the impacts of Californian thistle. In Research Report No. 314 (2009), *An Economic Review of the Effects of Climate Change,* co-written by Kaye-Blake, Suzie Greenhalgh (Landcare Research), James Turner (Scion), Ellen Holbek (AERU), Robyn Sinclair (Landcare Research), Tawhai Matunga (Research Assistant, AERU) and Caroline Saunders, research on several aspects of anthropogenic climate change was reviewed to derive climate change scenarios for analysis using the LTEM. Research Report No. 318 (2010), co-written with Frank Li (AgResearch Hamilton), A. McLeish Martin (AERU), Alan McDermott (AgResearch Hamilton), Scott Rains (AgResearch Hamilton), Steve Sinclair (AgResearch Hamilton) and Annette Kira (AgResearch Hamilton), *Multi-Agent Simulation Models in Agriculture: A Review of Their Construction and Uses*, was a review of the use of Multi Agent Simulation Models(MAS models) in agriculture. The review was conducted to identify the essential components of, and processes for, developing a usable model of the New Zealand pastoral sector for use by the New Zealand Rural Futures Trust.

Further examination of public opinion on, and perceptions of, biotechnology was reported in Research Report No. 295 (2007), *Why Do some of the Public Reject Novel Scientific Technologies? A Synthesis of Results from the Fate of Biotechnology Research*, co-written by Kaye-Blake, Hugh Campbell, Lesley Hunt and Andrew Cook. In this research a pressure-response-assessment-outcome model was used to re-examine data on public attitudes to biotechnology. The researchers found that there was a low public acceptance of biotechnologies, negative responses to the use of GM technology in food production in particular, and little change in these responses over time. Research Report No. 300 (2008), *Rural Population and Farm Labour Change*, written by Stéphanie Mulet-Marquis and Kaye Blake reported changes in the characteristics of rural New Zealand over time. During the 20th Century, rural populations had declined dramatically, although the total numbers of agriculture and fishery workers in New Zealand had not shown a similar decline. Worker turnover rates in the agricultural sector were found to be higher than in any other sector of the New Zealand economy, and average hourly earnings in the industry were lower than the national average. Research Report No. 301 (2008) *New Zealand Farm Structure Change and Intensification*, also co-authored by Mulet-Marquis and Kaye-Blake, reported on the use of data from different sources to update previous studies on farm structure. It was undertaken order to examine the impacts of intensification on the sustainability of farming. The main trends identified included an overall decrease in sheep and beef numbers and increase in dairy and deer numbers, with an increase in per-animal productivity.

John Fairweather's research during recent years included a number of studies on innovation. Simon Lambert and Fairweather examined the factors contributing to the successful commercialisation of ideas by New Zealand inventors in Report No. 320 (2010), *The Socio-Technical Networks of Technology Users' Innovation in New Zealand: A Fuzzy-set Qualitative Comparative Analysis*. This research, which was focussed on technology users who innovate, highlighted the potential complexity of TUI (technology user-innovators) networks, and showed that successful innovation often requires the release of an intensely personal technology, and the proactive management of key factors. In Research Report No. 321 (2010), *Comparison of Innovation Policies in selected European, Asian and Pacific Rim countries: How best to optimise Innovation Governance in New Zealand?*, Fairweather, Rene Wintjes, Julian Williams, Tiffany Rinne and Clare Nauwelars compared innovation policies in Europe, Asia, Australia and New Zealand (and other countries) in order to understand how

New Zealand could improve its innovation policies, They identified Finland and Denmark as consistent Innovation Leaders whose policies may be of potential benefit in New Zealand. Also included among Fairweather's works during this period was the AERU's final Discussion Paper, Discussion Paper No. 153 (2011), *Proceedings of the International Conference on Invention, Innovation and Commercialisation with Special Emphasis on Technology User Innovations (TUI),* the proceedings of a conference held in Christchurch to discuss technology innovation by end-users, which emphasised the development and promotion of improved technology. In 2011, Rinne and Fairweather produced a report that examined international models of innovation, Research Report No. 323, *An International Comparison of Models of Innovation and their Implications for New Zealand.* This work continued the AERU tradition of learning about, and from, the characteristics of New Zealand's overseas markets, and it concentrated on cultural values and how these can be formed into models of innovation.

Research Reports published by other AERU staff in recent years include Research Report No. 322, *The Economic and Social Value of Sport and Recreation to New Zealand*, part of the New Zealand Value of Sport & Recreation Series, written by Deputy Director Paul Dalziel, and published in September 2011. This report examined the key economic and social indicators that describe sport and recreation and presented estimates of the total contribution of the Sport and Recreation sectors to New Zealand GDP. Research Report No. 306 (2008), *The Socio-Economic Status of the South Island High Country*, was written by Glen Greer on one a number of studies of high country issues conducted at the time. Secondary data and survey results were used to examine the socio-economic status of the South Island high country during the period when the process of tenure review of Crown Pastoral Lease properties was the subject of heated debate. Greer's research indicated that many high country farmers were in financial difficulty after years of low incomes, stable working costs and rising debt servicing costs, and for many CPL farmers, the prospect of large rental increases appeared unsustainable. Research Assistant Ross Bowmar wrote Research Report No. 305 (2008), *Farmer Level Marketing: Case Studies in the South Island of New Zealand.* This described a study of the way in which, and the reasons why, red meat farmers incorporated farm level marketing activities into their operations. Bowmar evaluated the nature of marketing involvement, personality attributes, the process by which opportunities were identified, how marketing strategies were implemented, the role of relationships, and the impacts and risks associated with the incorporation of advanced marketing strategies into farming operations.

Research Associate Tiffany Rinne compared public perceptions of GE in agriculture and related issues in New Zealand and the United States in Research Report No. 304 (2008), *Cultural Models of GE Agriculture in the United States (Georgia) and New Zealand (Canterbury)*. Rinne found marked inter-cultural differences in both countries with respect to the way in which stakeholder groups cognitively model health and the environment, and in how they cognitively model GE technology. In Research Report No. 309 (2008), *Public Opinion on Freshwater Issues and Management in Canterbury*, Andrew Cook examined public opinion about aspects of freshwater management in Canterbury. He found that the Canterbury public placed a high value on access to water of suitable standard for contact and other forms of recreation; the availability of an inexpensive supply of clean, safe drinking water; and protection of the quality and quantity of freshwater for future generations.

During recent years, the AERU has published a series of reports, which identified key success factors for New Zealand primary sector products in global markets to which a number of authors from a range of institutions have contributed. Research Report No. 308 (2008), *The Key Elements of Success and Failure in the NZ Sheep Meat Industry from 1980-2007,* by

Alan McDermott and Angie Fisher (AgResearch, Hamilton), and Caroline Saunders, Eva Zellman and Tim Hope (AERU), described the mismatch between the sheepmeat market requirement for year-round supply of chilled meat and the seasonality of supply of New Zealand pastoral farming systems. Research Report No. 311 (2008), *The Key Elements of Success and Failure in the NZ Kiwifruit Industry*, written by Mark Kilgour and Frank Scrimgeour (University of Waikato), Saunders, and Zellman described the contextual and structural changes in the global market for kiwifruit, and key industry developments. They identified the need to develop future leadership capabilities; to continually update marketing strategies; to maintain government support; and to commission effective business and scientific research and development activity; as key challenges for the future. Nicola Shadbolt, Cornelius Williams, David Walters and Yimin Xu (Institute of Food, Nutrition and Human Health (IFNHH), College of Sciences, Massey University; and Alan McDermott and Tracy Payne (AgResearch, Hamilton) contributed to Research Report No. 312 (2008), *The Key Elements of Success and Failure in the NZ Venison Industry.* Their research found that the venison industry in New Zealand has limited market control, and faced a number of challenges including the volatility of venison supply and the inherent seasonality of both production and demand. The authors suggested that growth in the venison industry required careful management if the price volatility experienced in the past is to be avoided in future. Research Report No. 313 (2008), *The Key Elements of Success and Failure in the NZ Dairy Industry* was written by Daniel Conforte and Elena Garnevska (IFNHH); Mark Kilgour and Stuart Locke (Department of Economics and Marketing, Massey University); and Frank Scrimgeour (Department of Economics and Marketing, Massey University) Dairy industry success factors were identified including the development of international markets; effective political support in international markets; effective political support within New Zealand; effective evolution of industry structure, farmer engagement in policy, strategy and operations; continuing technological advance; maintaining disease-free status; and the development of economies of scale. Potential challenges to the industry included the increasing demands for improvements in animal welfare and animal health practices as well as a range of environmental challenges

Staff or other departments and from external organisations have continued to rely on the AERU as a publishing vehicle. Geoff Kerr and Simon Swaffield were co-authors of Research Report No. 298 (2007, *Amenity Values of Spring Fed Streams and Rivers in Canterbury, New Zealand: A Methodical Exploration.* They used the Q Sort methodology to derive key stream attributes from responses provided by a number of key informants and stakeholder groups, in order to undertake a choice modelling experiment to value the landscape consequences of different water allocation regimes. The results indicated that the maintenance of water quality or clarity, controlling gorse, and maximising summer flow occurrence (but not volume) were high priorities amongst the stakeholders surveyed. Research Report No. 303 (2007), *Impact of Wilding Trees on Indigenous Biodiversity: A Choice Modelling Study,* co-written by Geoff Kerr and Basil Sharp, was part of a broad research programme (managed by Nimmo-Bello & Company Ltd) investigating the economics of interventions to protect indigenous biota from invasions by alien species. This work was intended to establish the basis of future cost-benefit analyses of species protection programmes. Kerr and Sharp also wrote Research Report No. 310 (2008), *Biodiversity Management: Lake Rotoiti Choice Modelling Study,* describing the application of a choice experiment to estimate community preferences and the values associated with the impact of wasps on indigenous species in the South Island.

AERU reports by members of other Lincoln University departments in recent years include Report No. 292 (2007), *Operations at Risk: 2006 Findings from a Survey of Enterprise Risk in Australia and New Zealand,* written by Clive Smallman and Sukihbir Sandhu (Commerce

Division). The authors reported the analysis of a survey on enterprise risk conducted amongst businesses in Australia and New Zealand during December 2005 and January 2006. They concluded that responsibility for risk management is too frequently regarded as a responsibility of senior management only, and that the corresponding tenet of good risk management - that risk is everybody's concern - is not currently being followed. Peter Nuthall wrote Research Report No. 315 (2009), *Managerial Factors in Primary Production: Data from a Sample of New Zealand Farmers with an Emphasis on Experience as a Factor in Success*. In this report Nuthall presented the results of a postal survey designed to collect information to inform models of farmer managerial ability, and to determine and explore farmers' "Locus of Control" and its relationship to managerial ability. The results showed that experience, particularly early life experience, managerial style (personality), and farmer objectives were all strongly related to managerial ability.

Authors from outside the University have continued to publish the results of their research in AERU reports. These reports include Research Report No. 291 (2007), *Organic Certification Systems and Farmers' Livelihoods in New Zealand*, written by L.A. Herberg, a contribution to the discussion on organic production certification systems. Herberg compared the three main organic certification systems used in New Zealand and their effects on the livelihoods of farmer stakeholders. He reported that all three systems contributed to the achievement of farmers' livelihood goals. The two Third Party Certification (TPC) schemes that were evaluated (AgriQuality and BioGro) supported the business and export oriented agricultural enterprises of medium and large scale farmers while the third scheme, Participatory Group Scheme (PGS), (Organic Farm New Zealand, was very important for the success of small-scale farmers. Of particular value to these was the support offered by the scheme's group structure. Research Report No. 293 (2007), written by Rebecca Reider (Visiting Researcher, Fulbright New Zealand), *Growing Organically? Human Networks and the Quest to Expand Organic Agriculture in New Zealand*, was a review of developments in three organic industries that involved the examination of sector networks. Issues important to the future development of the New Zealand organic industries were discussed, and recommendations on information transfer and market coordination included.

2.6 Conclusion

It is important to remember the context in which the work described in the AERU reports of the past five decades was undertaken, when reading the reports today. The recommendations published during the Philpott era, for example, are for Government interventions that would be considered completely inappropriate in the political, economic and market environment that has prevailed since the restructuring of the 1980s. These changes have driven many of the changes in the nature of the research undertaken by AERU staff and associates. They have also been the subject of much of that research. If a catalogue of the AERU's research outputs were to be examined in conjunction with a history of New Zealand's agricultural and resource sectors, a strong correlation would be observed. The AERU has always been involved in researching key issues in New Zealand.

While there have been changes in the nature of the research undertaken during the last 50 years, the underlying objective of most of the research effort has been the same as it was in 1962, i.e. to contribute towards the achievement of improved outcomes for the primary sector. In the early years of the AERU, during the Bryan Philpott era, much of the research addressed New Zealand's need to increase productivity and export returns from the agricultural sector, as a means of achieving a higher standard of living for New Zealanders. Between 1971 and 1975, Jim Stewart's influence was evident in the body of work published on farm management issues and the effective use of rural resources.

From 1975 to 1985, under the successive leadership of Owen McCarthy, Barry Dent and Peter Chudleigh, a considerable body of work was undertaken on the conditions in, and influences on, markets for New Zealand's primary products, and appropriate structures for marketing organisations. Extensive use was made of econometric techniques, and the results of several long-running series of farmer surveys were published annually. During the Lattimore and Pryde years (1985 to 1988) the scope of AERU research was extended to include rural sociology and a wider range of trade policy studies. During this time the impacts of the structural reforms of the era led to a marked decline in the AERU's core funding, the end of funding for long-running series of farmer surveys, and a dramatic reduction in staff numbers.

Despite this, the published output of the AERU remained diverse during the quieter years of the Zwart and Cullen directorships, since the AERU continued to provide a publication vehicle for staff of other Lincoln College Departments and for external researchers. Several reports were published on the impacts of agricultural reform during this time.

Since 1991, under the directorship of Caroline Saunders, the AERU has experienced a resurgence. Staff numbers have increased, a number of long-term research programmes have provided greater security of funding, and the scope of AERU research has expanded in a number of new directions. In addition to the established fields of research, the research agenda of recent years has included extensive trade modelling; examination of the perceptions and impacts of new technologies; analysis of the potential impacts of climate change; evaluation of influences on sustainable development; and the development of new approaches to examining consumer preferences.

During the fifty years since its establishment the changes in the research output of the AERU have reflected the changes in the influences that most affect the primary production sector, and the changing role of agriculture in the New Zealand economy. As the sectoral emphasis has changed from increasing production to improving sustainability; enhancing resilience; and preventing environmental degradation, so too has the emphasis of AERU research. In keeping with its original purpose, the AERU has played an important role in investigating the key issues that have affected the economic, market and social environments in which New Zealand's primary sector operates. Successive directors have introduced fields of research and approaches to analysis that have been new, not only to the AERU, but to agricultural economics research in New Zealand. Recent publications demonstrate the diversity that has characterised AERU research from the outset.

References

Interview and questionnaire transcripts available from Teresa Cunningham, AERU, The Lodge, Lincoln University. Telephone (64) (3) 321-8280 for more information.

Agribusiness & Economics Research Unit. 2009. **Annual Report, 2009.** *Agribusiness & Economics Research Unit, Lincoln University. Lincoln, Canterbury, New Zealand.*

Agribusiness & Economics Research Unit. 1987. **Report for Year Ending 31st March 1987.** *Agricultural Economics Research Unit, Lincoln University. Lincoln, Canterbury, New Zealand.*

Agricultural Economics Research Unit. Compiled by A. Merwood, J. Biggs and H. Trent. 1982. **Abstracts of Publications, 1962 – March 1982.** *Agricultural Economics Research Unit, Lincoln University. Lincoln, Canterbury, New Zealand.*

Agricultural Economics Research Unit. 1972-1976. **Market Research Reports 1-9.** *Agribusiness & Economics Research Unit, Lincoln University. Lincoln, Canterbury, New Zealand.*

Agricultural Economics Research Unit. 1982. **Report for Year Ending 31st March 1982.** *Agricultural Economics Research Unit, Lincoln University. Lincoln, Canterbury, New Zealand.*

Agricultural Economics Research Unit. 1983. **Report for Year Ending 31st March 1983.** *Agricultural Economics Research Unit, Lincoln University. Lincoln, Canterbury, New Zealand.*

Agricultural Economics Research Unit. 1984. **Report for Year Ending 31st March 1984.** *Agricultural Economics Research Unit, Lincoln University. Lincoln, Canterbury, New Zealand.*

Agricultural Economics Research Unit. 1985. **Report for Year Ending 31st March 1985.** *Agricultural Economics Research Unit, Lincoln University. Lincoln, Canterbury, New Zealand.*

Agricultural Economics Research Unit. 1986. **Report for Year Ending 31st March 1986.** *Agricultural Economics Research Unit, Lincoln University. Lincoln, Canterbury, New Zealand.*

Agricultural Economics Research Unit. 1976. **Review, 1975-76.** *Agricultural Economics Research Unit, Lincoln University. Lincoln, Canterbury, New Zealand.*

Agricultural Economics Research Unit. 1978. **Review, 1977-78.** *Agricultural Economics Research Unit, Lincoln University. Lincoln, Canterbury, New Zealand.*

Agricultural Economics Research Unit. 1980. **Review, 1979-80.** *Agricultural Economics Research Unit, Lincoln University. Lincoln, Canterbury, New Zealand.*

Agricultural Economics Research Unit/Agribusiness & Economics Research Unit. 1962-2005. **Discussion Papers 1-152.** *Agribusiness & Economics Research Unit, Lincoln University. Lincoln, Canterbury, New Zealand.*

Agricultural Economics Research Unit/Agribusiness & Economics Research Unit. 1962-2011. **Research Reports 1-321.** *Agribusiness & Economics Research Unit, Lincoln University. Lincoln, Canterbury, New Zealand.*

Aldwell, P. 2010. **Interview, 10.00 am, 07/07/2010.** *Agribusiness and Economics Research Unit.* (Transcript available)

Blair, I.D. 1978. **The Seed They Sowed – Centennial Story of Lincoln College.** *Lincoln College, University College of Agriculture*.

Brown, W.A.N. 2010. **Interview, 29/09/2010.** *Agribusiness and Economics Research Unit.* (Transcript available)

Brown, W.A.N. 2010. **Response to Questionnaire.** *Agribusiness and Economics Research Unit.* (Copy available)

Central Canterbury News, January 28th 2009. **Lincoln professor's work recognised.**

Cullen, R. 2010. **Interview, 3.00 pm, 24/06/2010.** *Agribusiness and Economics Research Unit.* (Transcript available)

Dent, B. 2010. **Response to Questionnaire.** *Agribusiness and Economics Research Unit.* (Copy available)

Europa, 2011. **Treaty establishing the European Economic Community, EEC Treaty (original text).** *Europa Online. Available from http://europa.eu/legislation_summaries/institutional_affairs/treaties/treaties_eec_en.htm.*

Fairweather, J. 2010. **Interview, 2.00 pm, 24/06/2010.** *Agribusiness and Economics Research Unit.* (Transcript available)

Gough, J. 2010. **Interview, 1.00 pm, 12/07/2010.** *Agribusiness and Economics Research Unit.* (Transcript available)

Greer, G. 2010. **Interview, 12.30 pm, 27/06/2010.** *Agribusiness and Economics Research Unit.* (Transcript available)

Greer, G. 2010. **Interview, 9.30 am, 15/09/2010.** *Agribusiness and Economics Research Unit.* (Transcript available)

Lattimore, R. 2010. **Response to Questionnaire.** *Agribusiness and Economics Research Unit.* (Transcript available)

Lincoln College (University of Canterbury). 1962-1966. **Lincoln College: Newspaper and Journal Clippings, 1962-1966.** *Lincoln University, Canterbury, New Zealand.*

Lincoln College (University of Canterbury). 1962-1966. **Lincoln College: Newspaper and Journal Clippings, 1962-1966 (IMAGES).** *Lincoln University, Canterbury, New Zealand.*

Lincoln College (University of Canterbury). 1962-1968. **Annual Review.** *Lincoln University, Canterbury, New Zealand.*

Lincoln College (University of Canterbury). 1962-1968. **Annual Review (IMAGES).** *Lincoln University, Canterbury, New Zealand.*

Lincoln University. 1971-2010. **Calendar.** *Lincoln University, Canterbury, New Zealand.*

Lincoln University. 2010. **Transform: Research.** *Lincoln University, Canterbury, New Zealand.* Available from http://catalogue.lincoln.ac.nz/cgi-bin/Pwebrecon.cgi?BBID=448430

Nuthall, P. 2010. **Interview, 11.30 am, 07/06/2010.** *Agribusiness and Economics Research Unit.* (Transcript available)

Nuthall, P. 2010. **Interview, 11.00 am, 15/09/2010.** *Agribusiness and Economics Research Unit.* (Transcript available)

Philpott, B. 1989. **Jobs & High Wages: The Implications of Productivity Trends.** *Institute of Policy Studies: Studies in Productivity No 3.*

Philpott, B. 2000. **The Research Project on Economic Planning: A Brief Account of its 30 years of work, 1970-2000.** *Victoria Economic Commentaries Monograph Series. Number 2: 2000. Victoria University of Wellington, Wellington, New Zealand.*

Sandrey, R.A. 1987. **Gorse and Goats: Considerations for Biological Control of Gorse.** *Agricultural Economics Research Unit, Discussion Paper No 107. January 1987. Lincoln University, Canterbury, New Zealand.*

Sandrey, R.A. and Reynolds, R. (edit) 1990. **Farming Without Subsidies: New Zealand's Recent Experience.** *Ministry of Agriculture and Fisheries: GP Books.*

Saunders, C. 2010. **Interview, 12.30 pm, 07/06/2010.** *Agribusiness and Economics Research Unit.* (Transcript available)

Woods, M. 2010. **Interview, October 2010.** *Agribusiness and Economics Research Unit.* (Transcript available)

Zwart, A.C. 2010. **Interview, 12.30 pm, 24/06/2010.** *Agribusiness and Economics Research Unit.* (Transcript available)

Appendix I. List of AERU Publications

Research Reports

01. Ward, J.T. **The Systematic Evaluation of Development Projects.** 1962.
    Available from: http://hdl.handle.net/10182/1402
02. Philpott, B.P. **The New Agricultural Economics Unit.** 1962.
03. Ward, J.T. **Indicative Planning for the Poultry Industry.** 1963.
    Available from: http://hdl.handle.net/10182/3829
04. Frampton, A.R. **The International Sugar Situation and New Zealand's Sugar Policy.** 1964.
05. Philpott, B.P. **Economic Implications of Increased Agricultural Production.** 1963.
06. Stewart, J.D. Haslam, D.A.R. **Profitability of Irrigation in Mid-Canterbury.** 1964.
    Available from: http://hdl.handle.net/10182/1401
07. Stewart, J.D. Nuthall, P. **Programming a Canterbury Mixed Farm.** 1964.
    Available from: http://hdl.handle.net/10182/1419
08. Philpott, B.P. **Economic Implications of Increased Wool Production.** 1964.
09. Ward, J.T. **Investment Analysis for Farm Improvement.** 1964.
    Available from: http://hdl.handle.net/10182/1421
10. McArthur, A.T.G. **Profitability of a Recommended Strategy for Development on Two Banks Peninsula Farms.** 1965. Available from: http://hdl.handle.net/10182/1422
11. Philpott, B.P. **Factors Affecting Demand for Wool Textiles in New Zealand**. 1965.
    Available from: http://hdl.handle.net/10182/1345
12. Hampton, P. **The Degree of Protection Accorded by Import Licensing to New Zealand Manufacturing Industry.** 1965.
13. Philpott, B.P. **Fluctuations in Wool Prices, 1863-1963.** 1965.
14. Holden, J.S. **The Profitability of Hill Country Development: Part 1 – Analytical Methods.** 1965.
15. Townsley, R. **The Problem of Scheduling Sales of New Zealand Butter on the United Kingdom Market.** 1965.
16. Frampton, A.R. **A Market Target for the New Zealand Dairy Industry.** 1965.
17. Townsley, R. Schroder, W.R. **A Note on Breeding Flock Composition in Relation to Economic Criteria.** 1964.
18. Philpott, B.P. Beggs, D.M. **Trends in Production, Trade and Consumption of Wool & Wool Textiles.** 1965.
19. Guise, J.W.B. **Standardisation of Farm Accounts for Managerial Analysis.** 1965.
20. Taylor, N.W. **The Use of Linear Programming in Least-Cost Feed Compounding.** 1965.
21. Townsley, R. **The Maximisation of Revenue from New Zealand Sales of Butter on the United Kingdom Market – A Dynamic Programming Problem.** 1964.
    Available from: http://hdl.handle.net/10182/3899
22. Ward, J.T. **The Economic Approach to Resource Development in New Zealand.** 1965.
    Available from: http://hdl.handle.net/10182/1420
23. Philpott, B.P. Matheson, M.J. **An Analysis of the Retail Demand for Meat in the United Kingdom.** 1965.
24. Holden, J.S. **The Profitability of Hill Country Development: Part 2 – Case History Results.** 1965.
    Available from: http://hdl.handle.net/10182/1400
25. Philpott, B.P. **Strategic and Tactical Planning in International Marketing Policies.** 1966.
26. Agricultural Economics Research Unit. **Indexes of Cost of Investment Goods, 1949-50 to 1963-1964.** 1966.
    Available from: http://hdl.handle.net/10182/3891
27. Ward, J.T. Parkes, E.D. **An Economic Analysis of Large-Scale Land Development for Agriculture and Forestry.** 1965.
28. Townsley, R.J. Johnson, R.W.M. **A Review of the Argentine Beef Situation.** 1966.
    Available from: http://hdl.handle.net/10182/3880
29. Philpott, B.P. **Aspects of Productivity and Economic Growth in New Zealand, 1926-1964.** 1966.

Available from: http://hdl.handle.net/10182/3892

30. Philpott, B.P. Ross, B.J. McKenzie, C.J. Yandle, C.A. Hussey, D.D. **Estimates of Farm Income and Productivity in New Zealand, 1921-1965.** 1967.
    Available from: http://hdl.handle.net/10182/3878
31. Matheson, M.J. Philpott, B.P. **The Regional Pattern of the Demand for Meat in the United Kingdom.** 1967.
    Available from: http://hdl.handle.net/10182/1460
32. Philpott, B.P. **Long-Run Swings in Wool Prices.** 1966. [Not Published]
33. Holden, J.S. **The Economics of Hill Country Development.** 1966.

34. McClatchy, D. **Report on a Survey of Farm Labour in Patangata County, Hawke's Bay, 1965/66.** 1966.
    Available from: http://hdl.handle.net/10182/1423
35. Frengley, G.A.G. Tonkin, R.H.M. Johnson, R.M.W. **Programming Farm Development.** 1966.
36. Philpott, B.P. **Productivity, Planning and the Price Mechanism in New Zealand Manufacturing Industry.** 1966. Available from: http://hdl.handle.net/10182/1927
37. Court, R.H. **Some Projections of Retail Consumption in New Zealand.** 1966.
    Available from: http://hdl.handle.net/10182/1926
38. Morris, J.L. Cant, R.G. **The Nature and Extent of the Farm Labour Shortage in Cheviot County, Canterbury.** 1967. Available from: http://hdl.handle.net/10182/1925
39. Frengley, G.A.G. **Index to New Zealand Agricultural Publications 1964.** 1967.
    Available from: http://hdl.handle.net/10182/1298
40. Johnson, R.W.M. **High Country Development on Molesworth.** 1967.
    Available from: http://hdl.handle.net/10182/1350
41. Philpott, B.P. Ross, B.J. **Input-Output Models for Projecting and Planning the Economy.** 1968.
    Available from: http://hdl.handle.net/10182/3877
42. Philpott, B.P. Acland, H.T.D. Tairo, A.J. **Statistics of Production, Trade Flows and Consumption of Wool and Wool-Type Textiles.** 1967.
    Available from: http://hdl.handle.net/10182/3876
43. Yandle, C.A. **A Survey of Christchurch Consumer Attitudes to Meat.** 1967.
    Available from: http://hdl.handle.net/10182/1349
44. Jensen, R.C. Lewis, A.C. **Fertiliser and Production on a Sample of Intensive Sheep Farms in Southland, 1953-1964.** 1967.
45. Sanderson, K.T. McArthur, A.T.G. **Computer Methods for Development Budgets.** 1967.
    Available from: http://hdl.handle.net/10182/3871
46. Jensen, R.C. Lewis, A.C. **Budgeting Further Development on Intensive Sheep Farms in Southland.** 1967.
    Available from: http://hdl.handle.net/10182/3858
47. Johnson, R.W.M. **The Impact of Falling Prices on Taranaki Hill-Country Development.** 1967.
    Available from: http://hdl.handle.net/10182/3858
48. Jensen, R.C. (Editor.) **Proceedings of a New Zealand Seminar on Project Evaluation in Agriculture and Related Fields.** 1968. Available from: http://hdl.handle.net/10182/1280
49. Ross, B.J. **Inter-Industry Structure of the New Zealand Economy, 1961-1965.** 1968.
    Available from: http://hdl.handle.net/10182/3861
50. Kitson, G.W. **Fresh Vegetable Retailing in New Zealand: An Economic Survey.** 1968.
    Available from: http://hdl.handle.net/10182/1296
51. Morris, J.L. Plunkett, H.J. Johnson, R.W.M. **Livestock Targets in North Canterbury Hill Country: The Impact of Changing Prices.** 1968. Available from: http://hdl.handle.net/10182/1348
52. Francis, T.W. **Sectoral Capital Formation in New Zealand, 1958-65.** 1968.
    Available from: http://hdl.handle.net/10182/1346
53. Hamilton, B.N. Johnson, R.W.M. **Processing Peas: A Survey on Growers' Return 1967-68.** 1968.
    Available from: http://hdl.handle.net/10182/1297
54. Johnson, R.W.M. **Fertiliser Use in Southland.** 1969.
    Available from: http://hdl.handle.net/10182/1347

55. Philpott, B.P. Fletcher, G.A. Scott, W.G. **The Structure of Wool and Wool Textile Production, Trade and Consumption, 1948-1968.** 1969.
    Available from: http://hdl.handle.net/10182/3873
56. McClatchy, D. **Tower Silo Farming in New Zealand, Part 1: A Review.** 1969.
    Available from: http://hdl.handle.net/10182/1399
57. Edwards, D.R. Philpott, B.P. **Supply and Demand Projections of the United Kingdom Meat Market in 1975.** 1969. Available from: http://hdl.handle.net/10182/1300
58. McClatchy, D. **Tower Silo Farming in New Zealand, Part 2: Economic Possibilities.** 1969.
    Available from: http://hdl.handle.net/10182/1230
59. Hussey, D.D. Philpott, B.P. **Productivity and Income of New Zealand Agriculture 1927-1967.** 1969.
    Available from: http://hdl.handle.net/10182/1228
60. McClatchy, D. **Current Trends in New Zealand Beef Production and Disposal.** 1969.
    Available from: http://hdl.handle.net/10182/1231
61. Parkes, E.D. **Land Development by The State: An Economic Analysis of The Hindon Block, Otago.** 1969.
    Available from: http://hdl.handle.net/10182/1229
62. Johnson, R.W.M. **An Economic Analysis of Soil Conservation and Land Retirement on South Island High Country.** 1970. Available from: http://hdl.handle.net/10182/1255
63. Johnson, R.W.M. **A Regional Analysis of Future Sheep Production in New Zealand.** 1970.
    Available from: http://hdl.handle.net/10182/1256
64. Ho, K.Y. **An Economic Assessment of the Middle Class and Upper Middle Class Market in Malaya as a Potential Outlet for NZ Meat and Dairy Products.** 1970. Available from: http://hdl.handle.net/10182/1259
65. Johnson, R.W.M. **Capital Formation in New Zealand Agriculture, 1946-67.** 1970.
    Available from: http://hdl.handle.net/10182/1227
66. Kitson, G.W. **Distribution Costs and Efficiency for Fresh Fruit and Vegetables.** 1971.
    Available from: http://hdl.handle.net/10182/1257
67. O'Malley, T.R. **The Optimisation of a Sixteen Sector Model of the New Zealand Economy.** 1973.
    Available from: http://hdl.handle.net/10182/1299
68. Plunkett, H.J. **An Analysis of Lands and Survey Development Projects 1945-1969.** 1972.
    Available from: http://hdl.handle.net/10182/1258
69. Rodgers, J.R. **Quantitative Techniques for Forecasting: A Review with Applications to New Zealand Wool Prices for 1974-5.** 1974.
70. Charlton, P.J. **A Practical Guide to Tax Planning Using Procedures for Income Equalisation.** 1975.
    Available from: http://hdl.handle.net/10182/1157
71. McCarthy, W.O. Moffitt, R.G. Cosgriff, P.W. Chudleigh, P.D. **Studies in Costs of Production: Process Peas & Beans, 1974-75.** Available from: http://hdl.handle.net/10182/1168
72. Rodgers, J.R. McCarthy, O. Mabin, V. **Location of Farm Advisory Officers in New Zealand: An Application of Facility Location Analysis.** 1975. Available from: http://hdl.handle.net/10182/1158
73. Gough, J. McCarthy, O. **The Ambulance Facility Location Problem – A Survey of Methods and a Simple Solution.** 1975. Available from: http://hdl.handle.net/10182/1232
74. Gillespie, R.J. **Studies in Costs of Production – Town Milk Supply Farms, 1973-74.** 1976.
    Available from: http://hdl.handle.net/10182/1167
75. Chudleigh, P.D. Blackie, M.J. Dent, J.B. **Stabilising Post-Tax Incomes of New Zealand Sheep Farms.** 1976.
    Available from: http://hdl.handle.net/10182/1156
76. Gillespie, R.J. **Studies in Costs of Production: Town Milk Supply Farms, 1974-75.** 1976.
77. Gillespie, R.J. **Studies in Costs of Production: Town Milk Supply Farms, 1975-76.** 1977.
78. Ambler, T.I. **Response Patterns to a Mail Survey of New Zealand Farmers.** 1977.
    Available from: http://hdl.handle.net/10182/1159
79. Brodie, R.J. Mellon, M.J. **Wine: A Consumer Survey of Christchurch Households.** 1977.
    Available from: http://hdl.handle.net/10182/3662
80. Brown, W.A.N. Pearson, R.G. **The Energy Requirement of Farming in New Zealand.** 1977.

Available from: http://hdl.handle.net/10182/199
81. Pryde, J.G. **Survey of New Zealand Farmer Intentions, Expectations and Opinions, April-May 1977.** 1977.
Available from: http://hdl.handle.net/10182/212
82. Brodie, R.J. **Meat: A Consumer Survey of Christchurch Households.** 1977.
83. Chudleigh, P.D. **Marketing Costs for New Zealand Wool: 1970-71 to 1975-76.** 1977.
Available from: http://hdl.handle.net/10182/3684
84. Moffitt, R.G. Davey, L.E. **National Wheatgrowers' Survey, No 1: 1976-77.** 1977.
85. Chudleigh, P.D. **Shipping New Zealand's Agricultural Exports: Background and Issues.** 1978.
Available from: http://hdl.handle.net/10182/3874
86. Davey, L.E. **Current Cost Depreciation and the Valuation of Farm Tractors and Headers.** 1978.
Available from: http://hdl.handle.net/10182/3741
87. Harrison, S.R. **Optimum-Seeking Designs for Simulation Experiments with Models of Agricultural Systems.** 1978. Available from: http://hdl.handle.net/10182/1169
88. Woodford, K.B. Woods, L.D. **Production and Supply Relationships in the New Zealand Sheep and Beef Industries.** 1978.
Available from: http://hdl.handle.net/10182/3742
89. Fick, G.W. **Computer Simulation Models of Pasture Production in Canterbury: Description and User's Manual.** 1978. Available from: http://hdl.handle.net/10182/1173
90. Young, S.L. Ambler, T.I. Filan, S.J. **A Transport Survey of South Island Farmers.** 1979.
Available from: http://hdl.handle.net/10182/3856
91. Brodie, R.J. Mellon, M.J. **Bread: A Consumer Survey of Christchurch Households.** 1978.
Available from: http://hdl.handle.net/10182/3864
92. Davey, L.E. Lough, R.D. Lines, S.A. MacLean, R.M. Moffitt, R.G. **An Economic Survey of New Zealand Wheatgrowers, Survey No 2, 1977-78.** 1978.
Available from: http://hdl.handle.net/10182/3702
93. Davey, L.E. Moffitt, R.G. Pangborn, M. **An Economic Survey of New Zealand Town Milk Producers, 1976-1977.** 1978.
Available from: http://hdl.handle.net/10182/3855
94. Chudleigh, P.D. Clemes, M. Woods, L.D. **Marketing Costs for New Zealand Meat Exports, 1970-71 to 1975-76.** 1978.
Available from: http://hdl.handle.net/10182/3758
95. Kitson, G.W. **Interfibre Relationships and Textile Marketing in Japan.** 1978.
Available from: http://hdl.handle.net/10182/200
96. Pryde, J.G. **Survey of New Zealand Farm Intentions, Expectations and Opinions, June-August, 1978.** 1978.
Available from: http://hdl.handle.net/10182/368
97. Martin, S.K. **Peak Wool Flows Through the Marketing System.** 1979.
Available from: http://hdl.handle.net/10182/198
98. Moffitt, R.G. **An Economic Survey of New Zealand Town Milk Producers, 1977-1978.** 1979.
Available from: http://hdl.handle.net/10182/3757
99. Hubbard, L.J. Brown, W.A.N. **The Regional Impacts of Irrigation Development in the Lower Waitaki.** 1979.
Available from: http://hdl.handle.net/10182/3650
100. Martin, S.K. **Recent Trends in the Argentinean Wool Industry.** 1979.
Available from: http://hdl.handle.net/10182/3863
101. Lough, R.D. MacLean, R.M. McCartin, P.J. Rich, M.M. **An Economic Survey of New Zealand Wheatgrowers, Survey No 3, 1978-1979.** 1979.
102. Brodie, R.J. Mellon, M.J. **Cheese: A Consumer Survey of Christchurch Households.** 1979.
Available from: http://hdl.handle.net/10182/197
103. Inness, R.D. Zwart, A.C. **A Study of Excess Livestock Transport Costs in the South Island of New Zealand.** 1979.

104. Lough, R.D. MacLean, R.M. McCartin, P.J. Rich, M.M. **An Economic Survey of New Zealand Wheatgrowers: Financial Analysis, 1977-1978.** 1979. Available from: http://hdl.handle.net/10182/1174
105. Rich, M.M. Mellon, M.J. **Potatoes: A Consumer Survey of Christchurch and Auckland Households.** 1980. Available from: http://hdl.handle.net/10182/1175
106. Pryde, J.G. **Survey of New Zealand Farmer Intentions and Opinions, July-September, 1979.** 1980. Available from: http://hdl.handle.net/10182/1172
107. Mumford, J.D. **A Survey of Pests and Pesticide Use in Canterbury and Southland.** 1980.
108. Moffitt, R.G. **An Economic Survey of New Zealand Town Milk Producers 1978-79.** 1980. Available from: http://hdl.handle.net/10182/1125
109. Sheppard, R.L. **Changes in United Kingdom Meat Demand.** 1980. Available from: http://hdl.handle.net/10182/1177
110. Beck, A.C. **Brucellosis Eradication: A Description of a Planning Model.** 1980. Available from: http://hdl.handle.net/10182/1171
111. Brodie, R.J. **Fish: A Consumer Survey of New Zealand Wheatgrowers: Enterprise Analysis Survey No 4, 1979-1980.** 1980. Available from: http://hdl.handle.net/10182/1170
112. Rich, M.M. Foulds, L.J. **An Analysis of Alternative Wheat Pricing Schemes.** 1980. Available from: http://hdl.handle.net/10182/1078
113. Lough, R.D. MacLean, R.M. McCartin, P.J. Rich, M.M. **An Economic Survey of New Zealand Wheatgrowers: Enterprise Analysis Survey No 4, 1979-1980.** Available from: http://hdl.handle.net/10182/1076
114. Pryde, J.G. **A Review of the Rural Credit System in New Zealand, 1964 to 1979.** 1980. Available from: http://hdl.handle.net/10182/1176
115. Harris, G.T. **A Socio-Economic Study of Farm Workers and Farm Managers.** 1980. Available from: http://hdl.handle.net/10182/1077
116. Lough, R.D. MacLean, R.M. McCartin, P.J. Rich, M.M. **An Economic Survey of New Zealand Wheatgrowers: Financial Analysis, 1978-79.** 1980.
117. Hubbard, L.J. Brown, W.A.N. **Multipliers from Regional Non-Survey Input-Output Tables for New Zealand.** 1981.
118. Pryde, J.G. **Survey of the Health of New Zealand Farmers: October-November 1980.** 1981.
119. Sheppard, R.L. **Horticulture in Akaroa County.** 1981. Available from: http://hdl.handle.net/10182/213
120. Lough, R.D. McCartin, P.J. Rich, M.M. **An Economic Survey of New Zealand Town Milk Producers 1979-80.** 1981.
121. Lough, R.D. McCartin, P.J. Rich, M.M. **An Economic Survey of New Zealand Wheatgrowers: Enterprise Analysis Survey No 5, 1980-81.** 1981. Available from: http://hdl.handle.net/10182/201
122. Lough, R.D. McCartin, P.J. Rich, M.M. **An Economic Survey of New Zealand Wheatgrowers: Financial Analysis 1979-80.** 1981. Available from: http://hdl.handle.net/10182/196
123. Sheppard, R.L. **Seasonality in the New Zealand Meat Processing Industry.** 1982.
124. Borrell, B.W. Zwart, A.C. **The New Zealand Wheat and Flour Industry Market Structure and Policy Implications.** 1982.
125. Harris, G.T. **The Economics of Soil Conservation and Water Management Policies in the Otago High Country.** 1982. Available from: http://hdl.handle.net/10182/294
126. Pryde, J.G. **Survey of New Zealand Farmer Intentions and Opinions, September-November, 1981.** 1982. Available from: http://hdl.handle.net/10182/296
127. Laing, M.T. **The New Zealand Pastoral Livestock Sector: An Econometric Model (Version Two).** 1982. Available from: http://hdl.handle.net/10182/293
128. Thompson, A.M.M. **A Farm-Level Model to Evaluate the Impacts of Current Energy Policy Options.** 1982.
129. Moffitt, R.G. **An Economic Survey of New Zealand Town Milk Producers, 1980-1981.** 1982. Available from: http://hdl.handle.net/10182/290

130. Sheppard, R.L. **The New Zealand Potato Marketing System.** 1982.
131. Lough, R.D. McCartin, P.J. Rich, M.M. **An Economic Survey of New Zealand Wheatgrowers: Enterprise Analysis, Survey No 6, 1981-1982.** 1982.
132. Lough, R.D. McCartin, P.J. Rich, M.M. **An Economic Survey of New Zealand Wheatgrowers: Financial Analysis, 1980-81.** 1982.
133. Shadbolt, N.M. **Alternative Management Strategies and Drafting Policies for Irrigated Canterbury Sheep Farms.** 1982.
134. McArthur, A.T.G. **Economics of the Sheep Breeding Operations of the Department of Lands and Survey.** 1983.
135. Leathers, K.L. Sharp, B.M.H. Brown, W.A.N. **Water and Choice in Canterbury.** 1983. Available from: http://hdl.handle.net/10182/143
136. Pryde, J.G. McCartin, P.J. **Survey of New Zealand Farm Intentions and Opinions, October-December, 1982.** 1983. Available from: http://hdl.handle.net/10182/156
137. Laing, M.T. Zwart, A.C. **Investment and Supply Response in the New Zealand Pastoral Sector: An Econometric Model.** 1983. Available from: http://hdl.handle.net/10182/161
138. Blyth, N. **The World Sheepmeat Market: An Econometric Model.** 1983. Available from: http://hdl.handle.net/10182/253
139. Moffitt, R.G. **An Economic Survey of New Zealand Town Milk Producers.** 1983. Available from: http://hdl.handle.net/10182/269
140. Kagatsume, M. Zwart, A.C. **Economic Relationships within the Japanese Feed and Livestock Sector.** 1983. Available from: http://hdl.handle.net/10182/147
141. Lough, R.D. Brown, W.A.N. **New Zealand Arable Sector: Foreign Exchange Implications.** 1983. Available from: http://hdl.handle.net/10182/146
142. Lough, R.D. McCartin, P.J. **An Economic Survey of New Zealand Wheatgrowers: Enterprise Analysis, Survey No 7, 1982-1983.** 1983. Available from: http://hdl.handle.net/10182/142
143. Lough, R.D. McCartin, P.J. **An Economic Survey of New Zealand Wheatgrowers: Financial Analysis, 1981-82.** 1983. Available from: http://hdl.handle.net/10182/141
144. O'Donnell, D.K. Sandrey, R.A. **Development of the South Canterbury/Otago Southern Bluefin Tuna Fishery.** 1983. Available from: http://hdl.handle.net/10182/122
145. Sheppard, R.L. Hughes, S.A. **Potatoes: A Consumer Survey of Auckland, Wellington and Christchurch Households.** Available from: http://hdl.handle.net/10182/138
146. Hughes, S.A. Sheppard, R.L. **Potatoes: Distribution and Processing.** 1983. Available from: http://hdl.handle.net/10182/139
147. Brodie, R.J. Moffitt, R.G. Gough, J.D. **The Demand For Milk: An Econometric Analysis of the New Zealand Market.** 1984. Available from: http://hdl.handle.net/10182/140
148. Van Ameyde, A. Brodie, R.J. **The Christchurch Eating Out Markets.** 1984. Available from: http://hdl.handle.net/10182/245
149. Krause, M.A. Beck, A.C. Dent, J.B. **The Economics of Controlling Gorse in Hill Country: Goats versus Chemicals.** 1984. Available from: http://hdl.handle.net/10182/268
150. Laing, M.T. Sheppard, R.L. **The World Market for Fruit Juice Products: Current Situation and Prospects.** 1983. Available from: http://hdl.handle.net/10182/267
151. Laing, M.T. Sheppard, R.L. **The Economics of Controlled Atmosphere Storage and Transport for Nectarines, Apples and Kiwifruit.** 1984. Available from: http://hdl.handle.net/10182/266
152. Pryde, J.G. McCartin, P.J. **Survey of New Zealand Farmer Intentions and Opinions, October-December, 1983.** 1984. Available from: http://hdl.handle.net/10182/265
153. Sandrey, R.A. Zwart, A.C. **Dynamics of Herd Buildup in Commercial Deer Production.** 1984. Available from: http://hdl.handle.net/10182/264
154. Leathers, K.L. Williams, J.D. **The Economics of Farm Accidents and Safety in New Zealand Agriculture.** 1984. Available from: http://hdl.handle.net/10182/230
155. Thornton, P.K. Dent, J.B. Beck, A.C. **An Information System for the Control of Brown Rust in Barley.** 1984. Available from: http://hdl.handle.net/10182/263

156. McCrea, P.R. **An Assessment of the Effects of Road Dust on Agricultural Production Systems.** 1984.
Available from: http://hdl.handle.net/10182/820
157. Moffitt, R.G. **An Economic Survey of New Zealand Town Milk Producers, 1982-1983.** 1984.
Available from: http://hdl.handle.net/10182/228
158. Beck, A.C. Rathbun, J.P. Abbott, C.D. **The Optimal Location of Egg Production in New Zealand.** 1984.
Available from: http://hdl.handle.net/10182/216
159. Greer, G. **The Economics of Irrigation Development of the Amuri Plains Irrigation Scheme.** 1984.
Available from: http://hdl.handle.net/10182/235
160. Lough, R.D. McCartin, P.J. **An Economic Survey of New Zealand Wheatgrowers: Enterprise Analysis, Survey No 8.** 1984. Available from: http://hdl.handle.net/10182/217
161. Lough, R.D. McCartin, P.J. **An Economic Survey of New Zealand Wheatgrowers: Financial Analysis, 1982-83.** 1984.
Available from: http://hdl.handle.net/10182/3663
162. Leathers, K.L. Gough, J.D. **Farmland Pricing in an Inflationary Economy with Implications for Public Policy.** 1984.
Available from: http://hdl.handle.net/10182/3818
163. Beck, A.C. Dent, J.B. **An Analysis of Production, Consumption and Borrowing Behaviour in the North Island Hill Country Pastoral Sector.** 1984.
Available from: http://hdl.handle.net/10182/3860
164. Sandrey, R.A. O'Donnell, D.K. **New Zealand's Inshore Fishery: A Perspective on the Current Debate.** 1985.
Available from: http://hdl.handle.net/10182/3854
165. Fairweather, J.R. **Land Policy and Land Settlement in New Zealand: An Analysis of Land Policy Goals and an Evaluation of their Effect.** 1985. Available from: http://hdl.handle.net/10182/224
166. Fairweather, J.R. **Farm Enlargement in New Zealand.** 1985. Available from: http://hdl.handle.net/10182/247
167. Pryde, J.G. McCartin, P.J. **Survey of New Zealand Farmer Intentions and Opinions, October-December, 1984.** 1985.
Available from: http://hdl.handle.net/10182/3862
168. Hughes, S.A. Sheppard, R.L. **Market Prospects for Maize.** 1985.
Available from: http://hdl.handle.net/10182/215
169. Clemes, M.D. Woods, L.D. **Factor Cost Analysis of a New Zealand Meat Processing Company.** 1985.
Available from: http://hdl.handle.net/10182/226
170. Lough, R.D. McCartin, P.J. **An Economic Survey of New Zealand Wheatgrowers: Enterprise Analysis, Survey No 9, 1984-85.** 1985. Available from: http://hdl.handle.net/10182/226
171. Lough, R.D. McCartin, P.J. **An Economic Survey of New Zealand Wheatgrowers: Financial Analysis, 1983-84.** 1985.
Available from: http://hdl.handle.net/10182/3853
172. Sandrey, R.A. **Biological Control of Gorse: An Ex-Ante Evaluation.** 1985.
Available from: http://hdl.handle.net/10182/3870
173. Laing, M.T. Hughes, S.A. Sheppard, R.L. **The Competitive Position of New Zealand Fresh Fruit Exports.** 1985.
Available from: http://hdl.handle.net/10182/3824
174. Taylor, N.L. Lattimore, R.G. **Marketing Structures for the Horticultural Industry.** 1985.
Available from: http://hdl.handle.net/10182/295
175. Moffitt, R.G. **An Economic Survey of New Zealand Town Milk Producers, 1983-84.** 1985.
176. Moffitt, R.G. **A Financial and Economic Survey of South Auckland Town Milk Producers and Factory Supply Dairy Farmers, 1983-84.** 1985. Available from: http://hdl.handle.net/10182/262
177. Martin, S.K. Young, L. Zwart, A.C. **Optimal Pricing and Promotion for Agricultural Marketing Agencies.** 1986. Available from: http://hdl.handle.net/10182/494

178. Martin, S.K. Zwart, A.C. **A Contractual Framework for Evaluating Agricultural and Horticultural Marketing Channels.** 1986. http://hdl.handle.net/10182/609
179. Martin, S.K. Rae, A.N. Zwart, A.C. **An Integrated Framework for Analysing Agricultural Marketing Issues: A Summary Report of the CAPS/AERU Marketing Study Group.** 1986. Available from: http://hdl.handle.net/10182/608
180. St Hill, R.L. **Labour Mobility Between New Zealand and Australia.** 1986. Available from: http://hdl.handle.net/10182/272
181. Pryde, J.G. McCartin, P.J. **Survey of New Zealand Farmer Intentions and Opinions, November 1985 to January 1986.** 1986. Available from: http://hdl.handle.net/10182/3823
182. Moffitt, R.G. **A Financial and Economic Survey of South Auckland Town Milk Producers and Factory Supply Dairy Farmers, 1984-85.** 1986. Available from: http://hdl.handle.net/10182/225
183. Moffitt, R.G. **An Economic Survey of New Zealand Town Milk Producers, 1984-85.** 1986. Available from: http://hdl.handle.net/10182/234
184. Lough, R.D. McCartin, P.J. **An Economic Survey of New Zealand Wheatgrowers: Financial Analysis, 1984-85.** 1986. Available from: http://hdl.handle.net/10182/288
185. McCrea, P.R. **An Assessment of the Effects on Horticultural Production of Fugitive Dust and Ash from the Proposed Waikato Coal-Fired Power Station Activities.** 1986. Available from: http://hdl.handle.net/10182/291
186. Seed, P.G. Sandrey, R.A. Ward, B.D. **A Study of the Determinants of Fattening and Grazing Farm Land Prices in New Zealand, 1962 to 1983.** 1986. Available from: http://hdl.handle.net/10182/292
187. Fairweather, J.R. **Farmers' Responses to Economic Restructuring: Preliminary Analysis of Survey Data.** 1987.
188. Pryde, J.G. McCartin, P.J. **Survey of New Zealand Farmer Intentions and Opinions, October-December, 1986.** 1987. Available from: http://hdl.handle.net/10182/192
189. Lattimore, R. **Economic Adjustment in New Zealand: A Developed Country Case Study of Policies and Problems.** 1987. Available from: http://hdl.handle.net/10182/194
190. Moffitt, R.G. **An Economic Survey of New Zealand Town Milk Producers, 1985-86.** 1987. Available from: http://hdl.handle.net/10182/190
191. Griffith, G.R. Grundy, T.P. **The Supplementary Minimum Price Scheme: A Retrospective Analysis.** 1988. Available from: http://hdl.handle.net/10182/191
192. Grundy, T.P. Lattimore, R.G. Zwart, A.C. **New Zealand Livestock Sector Model: 1986 Version, Volume 1 & 2.** 1988. Available from: http://hdl.handle.net/10182/195
193. Gibson, J.K. **An Economic Analysis of the 1986 Deregulation of the New Zealand Egg Industry.** 1988. Available from: http://hdl.handle.net/10182/189
194. Sandrey, R.A. Scanlan, S. **Assistance To The Tourist Industry.** 1988. Available from: http://hdl.handle.net/10182/193
195. Sheppard, R.L. **Milk Purchasing: A Consumer Survey in Auckland and Christchurch.** 1988. Available from: http://hdl.handle.net/10182/188
196. Fairweather, J.R. **Employment and Unemployment in Rural Southland.** 1988. Available from: http://hdl.handle.net/10182/186
197. Zwart, A.C. Grundy, T.P. **Demand For Wool By Grade.** 1988. Available from: http://hdl.handle.net/10182/185
198. St Hill, R.L. **Financial Liberalisation in New Zealand: An Overview.** 1988. Available from: http://hdl.handle.net/10182/184
199. Fairweather, J.R. MacIntyre, A.A. **An Economic Evaluation of Coppice Fuelwood Production for Canterbury.** 1989. Available from: http://hdl.handle.net/10182/183
200. Grundy, T.P. **An Economic Evaluation of Biological Control of Rose-Grain Aphid in New Zealand.** 1989. Available from: http://hdl.handle.net/10182/174
201. Grundy, T.P. **An Economic Evaluation of Biological Control of Sweet Brier.** 1989. Available from: http://hdl.handle.net/10182/180

202. Grundy, T.P. **An Economic Evaluation of Biological Control of Hieracium.** 1989. Available from: http://hdl.handle.net/10182/179
203. Greer, G. Sheppard, R.L. **An Economic Evaluation of the Benefits of Research into Biological Control of Clematis Vitalba.** 1990. Available from: http://hdl.handle.net/10182/178
204. Fairweather, J.R. **The Q Method and Subjective Perceptions of Food in the 1990s.** 1990. Available from: http://hdl.handle.net/10182/177
205. Fairweather, J.R. Keating, N.C. **Management Styles of Canterbury Farmers: A Study of Goals and Success from the Farmers' Point of View.** 1990. Available from: http://hdl.handle.net/10182/176
206. McCrea, P.R. Grundy, T.P. Hay, D.C. **Tax Shields: Their Implications for Farm Project Investment, Risk and Return.** 1990. Available from: http://hdl.handle.net/10182/172
207. Fairweather, J.R. Campbell, H. **Public Drinking and Social Organisation in Methven and Mt Somers.** 1990. Available from: http://hdl.handle.net/10182/175
208. Keating, N.C. Little, H.M. **Generations in Farm Families: Transfer of the Family Farm in New Zealand.** 1991. Available from: http://hdl.handle.net/10182/181
209. Anderson, G.A. Frengley, G.A.G. Ward, B.D. **Determination of Farmland Values in New Zealand: The Significance of Financial Leverage.** 1991. Available from: http://hdl.handle.net/10182/182
210. Sheppard, R.L. Urqugart, L. **Attitudes to Pests and Pest Control Methods: Results from a Sample Survey of the NZ Population in February 1991.** 1991. Available from: http://hdl.handle.net/10182/187
211. Stallings, D.A. **Administered Protection in the United States during the 1980s: Exchange Rates and Institutions.** 1991. Available from: http://hdl.handle.net/10182/214
212. Lamb, C.G. Farr, D.J. McCartin, P.J. **The New Zealand Consumer Market For Cut Flowers in the 90s.** 1992. Available from: http://hdl.handle.net/10182/222
213. Fairweather, J.R. **Agrarian Restructuring in New Zealand.** 1992. Available from: http://hdl.handle.net/10182/232
214. Nuthall, P.L. **Actual and Potential Computer Use By A Group of Primary Producers.** 1992. Available from: http://hdl.handle.net/10182/233
215. Fairweather, J.R. **A Tree Model for Hawkes Bay Farmers' Tree Planting Decisions.** 1992. Available from: http://hdl.handle.net/10182/240
216. Gilmour, S. **History of the New Zealand Milk Board: A Study of the Corporatist Alliance Between the State and the Domestic Milk Sector.** 1992. Available from: http://hdl.handle.net/10182/246
217. Storey, L. **Changing Export Markets for New Zealand Sheepmeat: 1983-1991.** 1992. Available from: http://hdl.handle.net/10182/239
218. Greer, G. Rae, G. **An Economic Evaluation of Changes in the Allocation of Water for Irrigation from the Ashburton River.** 1992. Available from: http://hdl.handle.net/10182/238
219. Fairweather, J.R. Gilmour, S. **Farming in Hurunui and Clutha Counties: Current Attitudes and Practices Compared to Survey Results in 1986.** 1993. Available from: http://hdl.handle.net/10182/237
220. Fairweather, J.R. **Intending Smallholders' and Existing Smallholders' Perceptions of the Rural Lifestyle around Christchurch, New Zealand.** 1993. Available from: http://hdl.handle.net/10182/236
221. Sheppard, R.L. Kerr, G. Cullen, R. Ferguson, T. **Contingent Valuation of Improved Water Quality in the Lower Waimakariri River.** 1993. Available from: http://hdl.handle.net/10182/619
222. Fairweather, J.R. **Social Organisation of Large Herd Dairy Farms in New Zealand.** 1994. Available from: http://hdl.handle.net/10182/587
223. Thomson, G.F. **A Forecasting Model of New Zealand's Lamb Exports.** 1994. Available from: http://hdl.handle.net/10182/588
224. Fairweather, J.R. Swaffield, S. **Preferences for Land Use Options in the Mackenzie/Waitaki Basin.** 1994.
225. Nuthall, P.L. Bishop-Harley, G.J. **Feed Management and Computer Practices on a Sample of New Zealand Farms: Volume 1 – Expert Systems in Feed Management.** 1994. Available from: http://hdl.handle.net/10182/2576
226. Bishop-Harley, G.J. Nuthall, P.L. **An Expert System for Weaning Lambs.** 1994.

Available from: http://hdl.handle.net/10182/600
227. Bishop-Harley, G.J. Nuthall, P.L. **An Expert System for Sheep Drenching.** 1994.
Available from: http://hdl.handle.net/10182/1140
228. Bishop-Harley, G.J. Nuthall, P.L. **An Expert System for Surplus Feed Allocation.** 1994.
Available from: http://hdl.handle.net/10182/1189
229. Nuthall, P.L. Bishop-Harley, G.J. **The Application of Expert System Methodology to Feed Management: Volume 5 – Expert Systems in Feed Management.** 1994.
230. Gouin, D-M. Jean, N. Fairweather, J.R. **New Zealand Agricultural Policy Reform and Impacts on the Farm Sector: Detailed Historical Analysis Addressing the Issue of the Specificity of the Farm Sector.** 1994.
Available from: http://hdl.handle.net/10182/1699
231. Lattimore, R. McKeown, P. **New Zealand's International Trade Performance: Pre and Post Deregulation, 1970-1985 and 1985-1993.** 1995. Available from: http://hdl.handle.net/10182/1324
232. Morris, C. Loveridge, A. Fairweather, J.R. **Understanding Why Farmers Change Their Farming Practices: The Role of Orienting Principles in Technology Transfer.** 1995.
Available from: http://hdl.handle.net/10182/2253
233. Fairweather, J.R. Campbell, H. **The Decision Making of Organic and Conventional Agricultural Producers.** 1996. Available from: http://hdl.handle.net/10182/521
234. Helbling, R. **Family Farming Without State Intervention: Economic Factors Underlying the Prevalence of Family Farming – Theoretical Analysis and Case Study of New Zealand.** 1996.
Available from: http://hdl.handle.net/10182/2377
235. Butcher, G.V. **Regional Income and Employment Impacts of Farming and Forestry in the Mackenzie/Waitatki Basin.** 1997. Available from: http://hdl.handle.net/10182/724
236. Morris, C. Fairweather, J.R. Swaffield, S.R. **Investigating Community: Imperatives For by Constraints Against Land Use Change in the Mackenzie/Waitaki Basin.** 1997.
Available from: http://hdl.handle.net/10182/725
237. Araki, K. **A Comparison of the Structure and Practice of Dairy Farming in New Zealand and Japan.** 1998.
Available from: http://hdl.handle.net/10182/764
238. Campbell, H. Fairweather, J.R. **The Development of Organic Horticultural Exports in New Zealand.** 1998.
Available from: http://hdl.handle.net/10182/763
239. Cagatay, S. Lattimore, R. **A New Zealand Trade Share Database, 1966-1996.** 1998.
Available from: http://hdl.handle.net/10182/3333
240. Alam, J. **A Review of Economic Reforms in Bangladesh and New Zealand, and Their Impact on Agriculture.** 1999. Available from: http://hdl.handle.net/10182/590
241. Fairweather, J.R. Swaffield, S.R. **Public Perceptions of Natural and Modified Landscapes of the Coromandel Peninsula, New Zealand.** 1999. Available from: http://hdl.handle.net/10182/762
242. Hughey, K.F.D. Cullen, R. Kerr, G.N. Memon, P.A. **Instruments for Internalising the Environmental Externalities in Commercial Fisheries.** 2000. Available from: http://hdl.handle.net/10182/760
243. Cook, A.J. Fairweather, J.R. Campbell, H.R. **New Zealand Farmer and Grower Intentions to Use Genetic Engineering Technology and Organic Production Methods.** 2000.
Available from: http://hdl.handle.net/10182/759
244. Mayell, P.J. Fairweather, J.R. **Success Factors in New Land-Based Industries.** 2000.
Available from: http://hdl.handle.net/10182/758
245. Fairweather, J.R. Robertson, N.J. **Smallholders in Canterbury: Characteristics, Motivations, Land Use and Intentions to Move.** 2000. Available from: http://hdl.handle.net/10182/757
246. Fairweather, J.R. Mayell, P.J. Swaffield, S.R. **A Comparison of the Employment Generated by Forestry and Agriculture in New Zealand.** 2000. Available from: http://hdl.handle.net/10182/761
247. Fairweather, J.R. Mayell, P.J. Swaffield, S.R. **Forestry and Agriculture on the New Zealand East Coast: Socio-economic Characteristics Associated with Land Use Change.** 2000.
Available from: http://hdl.handle.net/10182/591

248. Swaffield, S.R. Fairweather, J.R. **Community Perception of Forest Sector Development on the New Zealand East Coast: Likely and Acceptable Employment Activities, Infrastructure and Landscape Change.** 2000.
Available from: http://hdl.handle.net/10182/756
249. Tomlinson, C.J. Fairweather, J.R. Swaffield, S.R. **Gisborne/East Coast Field Research on Attitudes to Land Use Change: An Analysis of Impediments to Forest Sector Development.** 2000.
Available from: http://hdl.handle.net/10182/754
250. Cullen, R. Hughey, K.F.D. Kerr, G.N. Memon, A. **Criteria to Evaluate the Application of Policy Instruments Designed to Internalise Externalities from Commercial Fisheries.** 2000.
Available from: http://hdl.handle.net/10182/753
251. Fairweather, J.R. Campbell, H.R. Tomlinson, C.J. Cook, A.J. **Environmental Beliefs and Farm Practices of New Zealand Organic, Conventional and GE Intending Farmers.** 2001.
Available from: http://hdl.handle.net/10182/752
252. Jackson, D. Tomlinson, C.J. Fairweather, J.R. Donaldson, I. **An Assessment of the Economic Costs of Relapsing-Remitting Multiple Sclerosis in the Canterbury/Westland Region of New Zealand.** 2001.
Available from: http://hdl.handle.net/10182/751
253. Fairweather, J.R. Campbell, H.R. **Research on the Consequences of Converting to Organic Production: A Review of International Literature and Outline of a Research Design for New Zealand.** 2001.
Available from: http://hdl.handle.net/10182/750
254. Cagatay, S. Saunders, C. **Lincoln Trade and Environmental Model (LTEM): An Agricultural Multi-Country, Multi-Commodity Partial Equilibrium Framework.** 2003.
Available from: http://hdl.handle.net/10182/749
255. Cross, T-A. Dalziel, P. Saunders, C. **North Canterbury: An Analysis of the Current Economic Base of the Region.** 2003. Available from: http://hdl.handle.net/10182/748
256. Kerr, G.N. Sharp, B.M.H. **Community Mitigation Preferences: A Choice Modelling Study of Auckland Streams.** 2003. Available from: http://hdl.handle.net/10182/747
257. Christensen, V. Saunders, C. **Economic Analysis of Issues Concerning Organic Dairy Farming.** 2003.
Available from: http://hdl.handle.net/10182/746
258. Fairweather, J.R. Maslin, C. Gossman, P. Campbell, H.R. **Farmer Views on the Use of Genetic Engineering in Agriculture.** 2003. Available from: http://hdl.handle.net/10182/755
259. Cook, A.J. Fairweather, J.R. **Change in New Zealand Farmer and Grower Attitudes Towards Gene Technology: Results from a Follow Up Survey.** 2003. Available from: http://hdl.handle.net/10182/728
260. Saunders, C. Dalziel, P. **The High-Tech Sector in Canterbury: A Study of its Potential and Constraints.** 2003.
Available from: http://hdl.handle.net/10182/744
261. Saunders, C. Kaye-Blake, W. Cagatay, S. **Economic Impacts on New Zealand of GM Crops: Result from Partial Equilibrium Modelling.** 2003. Available from: http://hdl.handle.net/10182/743
262. Lee, M. Gan, C. **Education Providers: A Qualitative Analysis of International Student Growth in Christchurch and Canterbury.** 2003. Available from: http://hdl.handle.net/10182/742
263. Cagatay, S. Saunders, C. Wreford, A. **Lincoln Trade and Environment Model (LTEM): Linking Trade and Environment.** 2003. Available from: http://hdl.handle.net/10182/741
264. Fairweather, J.R. Blackburn, A. Swaffield, S. Hock, B. **Values and Management Options for Sustainable Forest Management in New Zealand.** 2003. Available from: http://hdl.handle.net/10182/740
265. Coyle, F.J. Maslin, C. Fairweather, J.R. Hunt, L.M. **Public Understanding of Biotechnology in New Zealand: Nature, Clean Green Image and Spirituality.** 2003. Available from: http://hdl.handle.net/10182/739
266. Hunt, L.M. Fairweather, J.R. Coyle, F.J. **Public Understanding of Biotechnology in New Zealand: Factors Affecting Acceptability Rankings of Five Selected Biotechnologies.** 2003.
Available from: http://hdl.handle.net/10182/738

267. Saunders, C. Cagatay, S. Moxey, A.P. **Trade and Environment: Economic and Environmental Impacts of Global Dairy Trade Liberalisation.** 2004. Available from: http://hdl.handle.net/10182/727
268. Roberts, M. Fairweather, J.R. **South Island Maori Perceptions of Biotechnology.** 2004. Available from: http://hdl.handle.net/10182/745
269. Cook, A.J. Fairweather, J.R. Satterfield, T. Hunt, L.M. **New Zealand Public Acceptance of Biotechnology.** 2004. Available from: http://hdl.handle.net/10182/737
270. Kaye-Blake, W. Saunders, C. Fairweather, J.R. **Modelling the Trade Impacts of Willingness to Pay for Genetically Modified Food.** 2004. Available from: http://hdl.handle.net/10182/736
271. Cross, T-A. Dalziel, P. Saunders, C. **Selwyn District Council.** 2004. Available from: http://hdl.handle.net/10182/735
272. Kerr, G.N. Sharp, B.M.H. Leathers, K.L. **Instream Water Values: Canterbury's Rakaia and Waimakariri Rivers.** 2004. Available from: http://hdl.handle.net/10182/734
273. Fairweather, J.R. Swaffield, S.R. **Public Perceptions of Outstanding Natural Landscapes in the Auckland Region.** 2004. Available from: http://hdl.handle.net/10182/733
274. Greer, G. **The Costs of Footrot and the Impact of the Footrot Gene-Market Test in New Zealand: A Report for the Sustainable Farming Fund.** 2004. Available from: http://hdl.handle.net/10182/732
275. Parr, W.V. Green, J.A. White, G. **Wine Judging, Context and New Zealand Sauvignon Blanc.** 2005. Available from: http://hdl.handle.net/10182/731
276. Hughey, K.F.D. Wason, K.M. **Management of Himalayan Tahr in New Zealand: High Country Farmer Perspectives and Implications.** 2005. Available from: http://hdl.handle.net/10182/726
277. Cook, A.J. Fairweather, J.R. **New Zealanders and Biotechnology: Attitudes, Perceptions and Affective Reactions.** 2005. Available from: http://hdl.handle.net/10182/730
278. Cook, A.J. Fairweather, J.R. **Characteristics of Smallholdings in New Zealand: Results from a Nationwide Survey.** 2005. Available from: http://hdl.handle.net/10182/729
279. Kaye-Blake, W. Saunders, C. Emanuelsson, M. Dalziel, P. Wreford, A. **The Economic Contribution of Four Biotechnologies to New Zealand's Primary Sector.** 2005. Available from: http://hdl.handle.net/10182/151
280. Cook, A.J. Fairweather, J.R. **Smallholding in the Selwyn District.** 2005. Available from: http://hdl.handle.net/10182/152
281. Cook, A.J. Fairweather, J.R. **Nanotechnology – Ethical and Social Issues: Results from New Zealand Focus Groups.** 2005. Available from: http://hdl.handle.net/10182/153
282. Greer, G. **The Economic Benefits of the Possum Control Area Programme.** 2006. Available from: http://hdl.handle.net/10182/154
283. Roberts, M. Weko, F. Clarke. L. **Maramataka: The Maori Moon Calendar.** 2006. Available from: http://hdl.handle.net/10182/155
284. Gouin, D-M. **Agricultural Sector Adjustment Following Removal of Government Subsidies in New Zealand.** 2006. Available from: http://hdl.handle.net/10182/171
285. Saunders, C. Barber, A. Taylor, G. **Food Miles – Comparative Energy/Emissions Performance of New Zealand's Agriculture Industry.** 2006. Available from: http://hdl.handle.net/10182/125
286. Hunt, L. Fairweather, J.R. **The Influence of Perceptions of New Zealand Identity on Attitudes to Biotechnology.** 2006. Available from: http://hdl.handle.net/10182/126
287. Cook, A.J. Fairweather, J.R. **New Zealander Reactions to the Use of Biotechnology and Nanotechnology in Medicine, Farming and Food.** 2006. Available from: http://hdl.handle.net/10182/127
288. Dalziel, P. Saunders, C. Zellman, E. **Forecast of Skills Demand in the High Tech Sector in Canterbury: Phase Two.** 2006. Available from: http://hdl.handle.net/10182/128
289. Cook, A.J. Fairweather, J.R. **Nanotechnology – Ethical and Social Issues: Results from a New Zealand Survey.** 2006. Available from: http://hdl.handle.net/10182/129
290. Kogler, K. **Single Farm Payment in the European Union and Its Implications on New Zealand Dairy and Beef Trade.** 2006. Available from: http://hdl.handle.net/10182/130
291. Herberg, L.A. **Organic Certification Systems and Farmers' Livelihoods in New Zealand.** 2007. Available from: http://hdl.handle.net/10182/131

292. Smallman, C. Sandhu, S. **Operations at Risk: 2006 Findings from a Survey of Enterprise Risk in Australia and New Zealand.** 2007. Available from: http://hdl.handle.net/10182/132
293. Reider, R. **Growing Organically? Human Networks and the Quest to Expand Organic Agriculture in New Zealand.** 2007. Available from: http://hdl.handle.net/10182/133
294. Santiago, J.D. Saunders, C. **EU Positions in WTO: Impact on the EU, New Zealand and Australian Livestock Sectors.** 2007. Available from: http://hdl.handle.net/10182/134
295. Fairweather, J.R. Campbell, H. Hunt, L. Cook, A.J. **Why Do Some of the Public Reject Novel Scientific Technologies? A Synthesis of Results from the Fate of Biotechnology Research Programme.** 2007.
Available from: http://hdl.handle.net/10182/124
296. Kaye-Blake, W. Saunders, C. Ferguson, L. **Preliminary Economic Evaluation of Biopharming in New Zealand.** 2007. Available from: http://hdl.handle.net/10182/135
297. Saunders, C. Barber, A. **Comparative Energy and Greenhouse Gas Emissions of New Zealand's and the UK's Dairy Industry.** 2007. Available from: http://hdl.handle.net/10182/144
298. Kerr, G.N. Swaffield, S.R. **Amenity Values of Spring Fed Streams and Rivers in Canterbury, New Zealand: A Methodological Exploration.** 2007. Available from: http://hdl.handle.net/10182/287
299. Saunders, C. Hayes, P. **Air Freight Transport of Fresh Fruit and Vegetables.** 2007.
Available from: http://hdl.handle.net/10182/248
300. Mulet-Marquis, S. Fairweather, J.R. **Rural Population and Farm Labour Change.** 2008.
Available from: http://hdl.handle.net/10182/499
301. Mulet-Marquis, S. Fairweather, J.R. **New Zealand Farm Structure Change and Intensification.** 2008.
Available from: http://hdl.handle.net/10182/500
302. Kaye-Blake, W. Dhakal, B. **A Bioeconomic Model of Californian Thistle in New Zealand Sheep Farming.** 2008. Available from: http://hdl.handle.net/10182/355
303. Kerr, G.N. Sharp, B.M.H. **The Impact of Wilding Trees on Indigenous Biodiversity: A Choice Modelling Study.** 2007. Available from: http://hdl.handle.net/10182/354
304. Rinne, T. **Cultural Models of GE Agriculture in the United States (Georgia) and New Zealand (Canterbury).** 2008. Available from: http://hdl.handle.net/10182/680
305. Bowmar, R.K. **Farmer Level Marketing: Case Studies in the South Island of New Zealand.** 2008.
Available from: http://hdl.handle.net/10182/554
306. Greer, G. **The Socio-Economic Status of the South Island High Country.** 2008.
Available from: http://hdl.handle.net/10182/555
307. Kaye-Blake, W. Saunders, C. De Aragao Pereira, M. **Potential Impacts of Biopharming on New Zealand: Results from the Lincoln Trade and Environment Model.** 2008.
Available from: http://hdl.handle.net/10182/780
308. McDermott, A. Saunders, C. Zellman, E. Hope, T. Fisher, A. **The Key Elements of Success and Failure in the NZ Sheep Meat Industry from 1980-2007.** 2008. Available from:
http://hdl.handle.net/10182/960
309. Cook, A.J. **Public Opinion on Freshwater Issues and Management in Canterbury.** 2008.
Available from: http://hdl.handle.net/10182/802
310. Kerr, H.N. Sharp, B.M.H. **Biodiversity Management: Lake Rotoiti Choice Modelling Study.** 2008.
Available from: http://hdl.handle.net/10182/801
311. Kilgour, S. Saunders, C. Scrimgeour, F. Zellman, E. **The Key Elements of Success and Failure in the NZ Kiwifruit Industry.** 2008. Available from: http://hdl.handle.net/10182/862
312. Shadbolt, N.M. McDermott, A. Williams, C. Payne, T. Walters, D. Xu, Y. **The Key Elements of Success and Failure in the NZ Venison Industry.** 2008. Available from:
http://hdl.handle.net/10182/902
313. Conforte, D. Garnevska, E. Kilgour, M. Locke, S. Scrimgeour, F. **The Key Elements of Success and Failure in the NZ Dairy Industry.** 2008. Available from: http://hdl.handle.net/10182/1238
314. Kaye-Blake, W. Greenhalgh, S. Turner, J. Holbek, E. Sinclair, R. Matunga, T. Saunders, C. **A Review of Research on Economic Impacts of Climate Change.** 2009. Available from:
http://hdl.handle.net/10182/1223

315. Nuthall, P.L. **Managerial Factors in Primary Production: Data from a Sample of New Zealand Farmers with an Emphasis on Experience as a Factor in Success.** 2009. Available from: http://hdl.handle.net/10182/1222
316. Saunders, C., Kaye-Blake, W., Turner, J. **Modelling Climate Change Impacts on Agriculture and Forestry with the extended LTEM (Lincoln Trade and Environmental Model).** 2009. Available from**:** http://hdl.handle.net/10182/4138
317. Saunders, C. Dalziel, P. Kaye-Blake, W. **Economic Strategy Issues for the New Zealand Region in the Global Economy.** 2009. Available from: http://hdl.handle.net/10182/1394
318. Kaye-Blake, W. Li, F. McLeish Martin, A. McDermott, A. Rains, S. Sinclair, S. Kira, A. **Multi-Agent Simulation Models in Agriculture: A Review of Their Construction and Uses.** 2010. Available from: http://hdl.handle.net/10182/1928
319. Saunders, C. Guenther, M. Driver, T. **Sustainability Trends in Key Overseas Markets: Market Drivers and Implications to Increase Value for New Zealand Exports.** 2010. Available from: http://hdl.handle.net/10182/3338
320. Lambert, S. Fairweather, J.R. **The Socio-technical Networks of Technology Users' Innovation in New Zealand: A Fuzzy-set Qualitative Comparative Analysis.** 2010. Available from: http://hdl.handle.net/10182/3339
321. Fairweather, J.R. Wintjes, R. Williams, J. Rinne, T. Nauwelaers, C. **Comparison of Innovation Policies in selected European, Asian and Pacific Rim countries: How best to optimise Innovation Governance in New Zealand?** 2010. Available from: http://hdl.handle.net/10182/3365
322. Dalziel, P. **The Economic and Social Value of Sport and Recreation to New Zealand.** 2011. Available from: http://hdl.handle.net/10182/4315
323. Rinne, T. Fairweather, J.R. **An International Comparison of Models of Innovation and their Implications for New Zealand.** 2011. Available from: http://hdl.handle.net/10182/392
324. Saunders, C., McDonald, H., Driver, T. **Enhancing Value for New Zealand Farmers by Improving the Value Chain**. 2011. Available from:
325. Rinne, T., Fairweather, J.R. **An International Comparison of Models of Cultural and National identity and their Implications for New Zealand Innovation.** 2011. Available from:
326. Not yet published.
327. Greer, G., Saunders, C. **The Costs of Psa-V to the New Zealand Kiwifruit Industry and the Wider Community.** 2012. Available from:

Discussion Papers

01. Johnson, R.W.M. **A Review of Evaluation Studies in New Zealand Agriculture and Forestry.** 1967. Available from: http://hdl.handle.net/10182/1151
02. Jensen, R.C. **The Economic Evaluation of Investment in Large-Scale Projects – An Essay To Recommended Procedures.** 1968. Available from: http://hdl.handle.net/10182/1184
03. Jensen, R.C. **Economic Evaluation of Water Resources Development.** 1968. Available from: http://hdl.handle.net/10182/1181
04. Norton, A.C. Jensen, A.C. **An Illustrative Example of Evaluation Procedures (Drainage Scheme – North Canterbury).** 1968. Available from: http://hdl.handle.net/10182/1180
05. Philpott, B.P. Ross, B.J. **The Shape of the New Zealand Economy in 1980.** 1968. Available from: http://hdl.handle.net/10182/1101
06. Johnson, R.W.M. **Economic Problems of New Zealand Agriculture.** 1968. Available from: http://hdl.handle.net/10182/1150
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08. McKenzie, C.J. Philpott, B.P. Woods, M.J. **Price Formulation in the Raw Wool Market.** 1969. Available from: http://hdl.handle.net/10182/1124

09. Lewis, A.C. **Agricultural Production Functions.** 1969. Available from: http://hdl.handle.net/10182/1104
10. Philpott, B.P. **Regional Economic Development in the Context of the Changing New Zealand Economy.** 1969. Available from: http://hdl.handle.net/10182/1149
11. Yandle, C.A. **Quarterly Estimates of New Zealand Meat Price, Consumption and Allied Data, 1946-1965.** 1968. Available from: http://hdl.handle.net/10182/1152
12. Ross, B.J. Philpott, B.P. **Indicative Economic Planning with a Sixteen Sector Projection Model of the New Zealand Economy.** 1969. Available from: http://hdl.handle.net/10182/1148
13. Pilling, R.G. **Recent Developments in the Meat Industry with Particular Reference to Otago and Southland.** 1969. Available from: http://hdl.handle.net/10182/1118
14. Johnson, R.W.M. Litt, B. **The Future Profitability of Beef Production in New Zealand.** 1970. Available from: http://hdl.handle.net/10182/1182
15. Philpott, B.P. **Demand Prospects for Beef.** 1970. Available from: http://hdl.handle.net/10182/1183
16. Philpott, B.P. Scott, W.G. **The Structure of Wool and Wool Textile Production, Trade and Consumption 1958-69.** 1970. Available from: http://hdl.handle.net/10182/1185
17. Johnson, R.W.M. **Trends in the Terms of Exchange and Productivity in the New Zealand Dairy Industry.** 1970. Available from: http://hdl.handle.net/10182/1120
18. Lewis, A.C. Murray, S.M.C. **Marketing Margins for New Zealand Lamb and for All Lamb and Mutton in the United Kingdom.** 1970. Available from: http://hdl.handle.net/10182/1092
19. Philpott, B.P. O'Malley, T.R. **A Pilot Optimisations Model for the 1972/73 N.D.C. Plan.** 1970. Available from: http://hdl.handle.net/10182/1093
20. Johnson, R.W.M. Hadfield, S.M. **Recent Trends in Capital Formation in New Zealand Agriculture, 1964-1969.** 1971. Available from: http://hdl.handle.net/10182/1267
21. Hussey, D.D. Philpott, B.P. **Productivity and Income of New Zealand Agriculture 1921-67.** 1972. Available from: http://hdl.handle.net/10182/1268
22. Philpott, B.P. Greig, I.D. Wright, A. **Some Aspects of the Economics of Nitrogen Storage Farming in New Zealand.** 1971. Available from: http://hdl.handle.net/10182/1102
23. Smith, A.W. **Economic Aspects of Stone Fruit Marketing in New Zealand.** 1971. Available from: http://hdl.handle.net/10182/1186
24. McCarthy, W.O. **New Zealand, The Ten and Future Market Strategies.** 1972. Available from: http://hdl.handle.net/10182/1226
25. McCarthy, W.O. **The Wool Acquisition Controversy.** 1974. Available from: http://hdl.handle.net/10182/1224
26. Ross, B.J. **Productivity.** 1974. Available from: http://hdl.handle.net/10182/1225
27. Ross, B.J. **Investment on the Rural Scene.** 1974. Available from: http://hdl.handle.net/10182/1121
28. Ross, B.J. **The Oil Crisis and International Economic Stability.** 1974. Available from: http://hdl.handle.net/10182/1116
29. Wood, J.W. **Christchurch Tomorrow: A Discussion of the Future Development of Christchurch as a Regional Centre.** 1975. Available from: http://hdl.handle.net/10182/1194
30. Ambler, T.I. **Use Made of Transport by Farmers: A Pilot Survey with Findings Relating to Ashburton County.** 1975. Available from: http://hdl.handle.net/10182/1122
31. Pryde, J.G. **A Postal Sample Survey of Sheep Farmer Attitudes to Incentives and Obstacles to Increasing Farm Output and Other Agricultural Policy Issues.** 1975. Available from: http://hdl.handle.net/10182/1100
32. Pryde, J.G. McCarthy, W.O. Fyfe, D.L. (Editors.) **Proceedings of a Seminar on Costs Beyond the Farm Gate (Lincoln College, 12 March 1976).** 1976. Available from: http://hdl.handle.net/10182/1099
33. Pryde, J.G. **A Postal Survey of the Opinions of a Group of Farm Management Society Members on Incentives and Obstacles to Increasing Farm Output.** 1976. Available from: http://hdl.handle.net/10182/1103
34. Chudleigh, P.D. Filan, S.J. **A Statistical Analysis of Sources of Variance of Income on Sheep Farms in New Zealand.** 1976. Available from: http://hdl.handle.net/10182/882
35. Ambler, T.I. **Rate Regulation and Economic Efficiency in Rural Road Goods Transport.** 1976.

Available from: http://hdl.handle.net/10182/883
36. McCarthy, W.O. Pryde, J.G. (Editors.) **Proceedings of a Seminar on Wool Marketing in the 1980s (Lincoln College, 21 October 1976).** 1976. Available from: http://hdl.handle.net/10182/965
37. Chudleigh, P.D. **Some Economic Aspects of Conference and Non-Conference Wool Shipping.** 1976.
Available from: http://hdl.handle.net/10182/1002
38. Kitson, G.W. **A Comment on Fisheries and Agricultural Trade Relationships between New Zealand and Japan.** 1978. Available from: http://hdl.handle.net/10182/1003
39. Leitch, D. Chudleigh, P.D. Frengley, G.A.G. **A Survey of Mid Canterbury Farmers' Attitudes to Growing Sugar Beet.** 1978. Available from: http://hdl.handle.net/10182/1001
40. Chudleigh, P.D. Young, S.L. Brown, W.A.N. **New Zealand Agriculture and Oil Price Increases.** 1979.
Available from: http://hdl.handle.net/10182/1000
41. Zwart, A.C. Wilson, L.J. (Editors.) **The Development of Rational Policies for Agricultural Trade between New Zealand and Japan: Proceedings of a Seminar Sponsored by the Japan Advisory Committee (Wellington, 12 December 1978).** 1979. Available from: http://hdl.handle.net/10182/1208
42. Sheppard, R.L. O'Donnell, D.K. **A Review of the New Zealand Goat Industry.** 1979.
Available from: http://hdl.handle.net/10182/999
43. O'Donnell, D.K. Sheppard, R.L. **Goats: A Bibliography.** 1979. Available from: http://hdl.handle.net/10182/1050
44. Brodie, R.J. Sheppard, R.L. Chudleigh, P.D. (Editors.) **Proceedings of a Seminar/Workshop on the New Zealand Goat Industry.** 1979. Available from: http://hdl.handle.net/10182/1059
45. Harris, G.T. Stevenson, T.W. **An Evaluation of the Southland Flood Relief Temporary Employment Programme.** 1979. Available from: http://hdl.handle.net/10182/1123
46. Rich, M.M. Zwart, A.C. **Economic Factors Affecting Wheat Areas Within New Zealand.** 1979.
Available from: http://hdl.handle.net/10182/994
47. Sheppard, R.L. Beun, N.J. **Japanese Food Policy and Self-Sufficiency: An Analysis with Reference to Meat.** 1979. Available from: http://hdl.handle.net/10182/995
48. Brown, W.A.N. Dent, J.B. **Corporate Structure of a Beet-Ethanol Industry.** 1980.
Available from: http://hdl.handle.net/10182/1041
49. Chudleigh, P.D. **The Cost of Overseas Shipping: Who Pays?** 1980.
Available from: http://hdl.handle.net/10182/1025
50. Sheppard, R.L. **Market Evaluation: A Systematic Approach – Frozen Green Sprouting Broccoli.** 1980.
Available from: http://hdl.handle.net/10182/642
51. Blyth, N. **The E.E.C. Sheepmeat Regime: Arrangements and Implications.** 1980.
Available from: http://hdl.handle.net/10182/616
52. Sheppard, R.L. Brodie, R.J. (Editors.) **Proceedings of a Seminar on Future Directions for New Zealand Lamb Marketing.** 1980. Available from: http://hdl.handle.net/10182/657
53. Harris, G.T. **The Evaluation of Job Creation Programmes with Particular Reference to the Farm Employment Programme.** 1981. Available from: http://hdl.handle.net/10182/644
54. Laing, M.T. Zwart, A.C. **The New Zealand Pastoral Livestock Sector: A Preliminary Econometric Model.** 1981. Available from: http://hdl.handle.net/10182/645
55. Shadbolt, N.M. **The Schedule Price System and the New Zealand Lamb Producer.** 1981.
Available from: http://hdl.handle.net/10182/659
56. Silcock, K.M. Sheppard, R.L. **The Further Processing of Meat.** 1981.
Available from: http://hdl.handle.net/10182/660
57. Zwart, A.C. **Japanese Agricultural Policy Development: Implications for New Zealand.** 1981.
Available from: http://hdl.handle.net/10182/661
58. Woodford, K.B. **Interest Rates: Facts and Fallacies.** 1981. Available from: http://hdl.handle.net/10182/661
59. Blyth, N. **The E.E.C. Sheepmeat Regime: One Year On.** 1981. Available from: http://hdl.handle.net/10182/663

60. Blyth, N. **A Review of the World Sheepmeat Market: Volume 1 – Overview of International Trade; Volume 2 – Australia, New Zealand and Argentina; Volume 3 – The E.E.C. (10); Volume 4 – North America, Japan and The Middle-East; Volume 5 – Eastern Bloc, USSR and Mongolia.** 1981.
    Available in five parts from:
    http://hdl.handle.net/10182/611; http://hdl.handle.net/10182/612; http://hdl.handle.net/10182/613; http://hdl.handle.net/10182/614; and http://hdl.handle.net/10182/615
61. Woodford, K.B. **An Evaluation of Farm Ownership Savings Accounts.** 1981.
    Available from: http://hdl.handle.net/10182/688
62. Ross, B.J. Sheppard, R.L. **The New Zealand Meat Trade in the 1980s: A proposal for change.** 1982.
    Available from: http://hdl.handle.net/10182/689
63. Sheppard, R.L. Biggs, J.M. **Supplementary Minimum Prices: A production incentive?** 1982.
    Available from: http://hdl.handle.net/10182/690
64. Chudleigh, P.D. Nicholson, A.J. (Editors.) **Proceedings of a Seminar on Road Transport in Rural Areas.** 1982.
    Available from: http://hdl.handle.net/10182/904
65. Rich, M.M. **Quality in the New Zealand Wheat and Flour Markets.** 1982.
    Available from: http://hdl.handle.net/10182/766
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    Available from: http://hdl.handle.net/10182/1199
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70. Laing, M.T. Zwart, A.C. **The Pastoral Livestock Sector and the Supplementary Minimum Price Policy.** 1983.
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79. Moffitt, R.G. (Editor.) **Consider Japan: Papers from a Seminar Conducted by the Japan Centre of Christchurch (Chamber of Commerce Conference Room, 11 May 1983).** 1984.
    Available from: http://hdl.handle.net/10182/997
80. Sheppard, R.L. Fowler, D.E. **Deregulation: Impact on the Christchurch Meat Industry.** 1984.

Available from: http://hdl.handle.net/10182/694

81. Ryde, J. Nuthall, P.L. **Farmers Record Keeping and Planning Practices: A Postal Survey.** 1984. Available from: http://hdl.handle.net/10182/998
82. Pryde, J.G. Bain. L.B. **The State of Agricultural Credit in New Zealand.** 1984. Available from: http://hdl.handle.net/10182/1004
83. Attwood, E.A. **The Future of the Common Agricultural Policy and Its Implications for New Zealand.** 1984. Available from: http://hdl.handle.net/10182/695
84. Fowler, D.E. **The Economic Potential of Growth-Promoting Agents in Beef.** 1984. Available from: http://hdl.handle.net/10182/696
85. Attwood, E.A. **Some Aspects of the Farm Income Situation in New Zealand.** 1984. Available from: http://hdl.handle.net/10182/770
86. Pryde, J.G. Bain, L.B. **Financing New Zealand Horticulture.** 1984. Available from: http://hdl.handle.net/10182/781
87. Attwood, E.A. **The New Zealand Farm Business and the Current Changes in its Structure.** 1984. Available from: http://hdl.handle.net/10182/782
88. Guthrie, S.E. Lattimore, R.G. **The Agricultural Sector in New Zealand – A Joint Farm-Industrial Perspective.** 1984. Available from: http://hdl.handle.net/10182/783
89. Attwood, E.A. **The Current Situation and Policies of the New Zealand Cereals Sector.** 1984. Available from: http://hdl.handle.net/10182/784
90. Attwood, E.A. **The Current Situation and Future Development of the New Zealand Pig Industry.** 1985. Available from: http://hdl.handle.net/10182/785
91. Lough, R.D. **North Island Maize Production, 1983-84.** 1985. Available from: http://hdl.handle.net/10182/786
92. Rathbun, J.P. Zwart, A.C. **The Sandwich Algorithm for Spatial Equilibrium Analysis.** 1985. Available from: http://hdl.handle.net/10182/787
93. Pryde, J.G. Bain, L.B. **A Review of Agricultural Credit in New Zealand.** 1985. Available from: http://hdl.handle.net/10182/788
94. Lattimore, R.G. **New Zealand Economic Development: A Brief Overview of Unbalanced Industry Growth.** 1985. Available from: http://hdl.handle.net/10182/789
95. Attwood, E.A. **Economic Aspects of Agricultural Education and Training in New Zealand.** 1985. Available from: http://hdl.handle.net/10182/795
96. Wood-Belton, M. Lattimore, R.G. **Supply Response Parameters in New Zealand Agriculture – A Literature Search.** 1985. Available from: http://hdl.handle.net/10182/796
97. Agricultural Economics Research Unit. **Papers Presented at the New Zealand Branch Australian Agricultural Economic Society Conference, Picton, July 1985.** 1985. Available from: http://hdl.handle.net/10182/768
98. Fowler, D.E. Sheppard, R.L. Hughes, S.A. **An Examination of Alternative Marketing Structures – A Literature Search.** 1985. Available from: http://hdl.handle.net/10182/797
99. Fairweather, J.R. **Farm Structure Change in New Zealand and its Implications for Policy.** 1986. Available from: http://hdl.handle.net/10182/798
100. Juchau, R.H. **Accounting Developments and Implications for Farm Business.** 1986. Available from: http://hdl.handle.net/10182/799
101. Sandrey, R.A. **Maori Fishing Rights in New Zealand: An Economic Perspective.** 1986. Available from: http://hdl.handle.net/10182/800
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104. Lattimore, R.G. **Farmlands Grain (N.Z.) Society Ltd – A Marketing Audit, 1980-1984.** 1986 Available from: http://hdl.handle.net/10182/811
105. Fairweather, J.R. (Editor.) **Proceedings of the New Zealand Rural Economy and Society Study Group Seminar.** 1986. Available from: http://hdl.handle.net/10182/812

106. Agricultural Economics Research Unit. **Papers Presented at the New Zealand Branch Australian Agricultural Economic Society Conference, Blenheim, June 1986 – Volumes 1 & 2.** 1986. Available from: http://hdl.handle.net/10182/838
107. Sandrey, R.A. **Gorse and Goats: Considerations for Biological Control of Gorse.** 1987. Available from: http://hdl.handle.net/10182/813
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112. Greer, G. Chamberlain, J.E. **Economic Evaluation of Matua Prairie Grass as a Pasture Species on Canterbury Sheep Farms.** 1987. Available from: http://hdl.handle.net/10182/352
113. Fairweather, J.R. (Editor.) **Proceedings of the Rural Economy and Society Study Group Two-Day Symposium on Rural Research Needs, 7-8 July, 1987.** 1987. Available from: http://hdl.handle.net/10182/1071
114. Pryde, J.G. **A Summary of the Financial Position of Canterbury Farms, Mid-1987.** 1987. Available from: http://hdl.handle.net/10182/496
115. St Hill, R.L. **A Case for Removal of Tariff Protection.** 1987. Available from: http://hdl.handle.net/10182/495
116. Griffith, G.R. Martin, S.K. **An Overview of Government Policies for the New Zealand Livestock Industries, with Emphasis on Recent Price Stabilisation and Price Support Schemes.** 1988. Available from: http://hdl.handle.net/10182/815
117. Zwart, A.C. Martin, S.K.. **The New Zealand Sheepmeat Industry and the Role of the New Zealand Meat Producers' Board.** 1988. Available from: http://hdl.handle.net/10182/816
118. Nuthall, P.L. Oliver, P.R. **Desirable Attributes of Computerised Financial Systems for Property Managers.** 1988. Available from: http://hdl.handle.net/10182/817
119. Agricultural Economics Research Unit. **Papers Presented at the New Zealand Branch Australian Agricultural Economics Society Conference, Blenheim, July 1987 – Volumes 1 & 2.** 1988. Available from: http://hdl.handle.net/10182/847
120. Nuthall, P.L. **Challenges in Computer Systems for Farmers.** 1988. Available from: http://hdl.handle.net/10182/818
121. Agricultural Economics Research Unit. **Papers Presented at the New Zealand Branch Australian Agricultural Economics Society Conference, Blenheim, July 1988 – Volumes 1 & 2.** 1988. Available from: http://hdl.handle.net/10182/848
122. Moffitt, R.G. Sheppard, R.L. **A Review of the Deregulation of the New Zealand Town Milk Industry.** 1988. Available from: http://hdl.handle.net/10182/1051
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126. Lattimore, R.G. McCann, E. **Marketing Boards and Anti-Trust Policy.** 1989. Available from: http://hdl.handle.net/10182/1187
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129. Fairweather, J.R. (Editor.) **Proceedings of the Rural Economy and Society Section of the Sociological Association of Aotearoa (NZ).** 1991. Available from: http://hdl.handle.net/10182/849
130. Wright, J.K.D. **Evolutionary Bargaining Games.** 1991. Available from: http://hdl.handle.net/10182/850
131. Agribusiness and Economics Research Unit. **Papers Presented at the New Zealand Branch Australian Agricultural Economics Society Conference, Sixteenth Annual Conference.** 1991. Available from: http://hdl.handle.net/10182/1193
132. Fairweather, J.R. **Topics for Rural Social Research.** 1992. Available from: http://hdl.handle.net/10182/910
133. Agribusiness and Economics Research Unit. **Papers Presented at the New Zealand Branch Australian Agricultural Economics Society Conference, Seventeenth Annual Conference.** 1992. Available from: http://hdl.handle.net/10182/1024
134. Seed, P. **Capital Budgeting and Policy Evaluation using Option Pricing Theory.** 1992. Available from: http://hdl.handle.net/10182/851
135. Sheppard, R.L. **New Zealand Agricultural Policy Change: Some Effects.** 1993. Available from: http://hdl.handle.net/10182/341
136. Agribusiness and Economics Research Unit. **Papers Presented at the Eighteenth Annual Conference of the New Zealand Branch Australian Agricultural Economics Society, Blenheim, July 1993.** 1993. Available from: http://hdl.handle.net/10182/963
137. Nayga Jr, R.M. Waggoner, D.B. **Competing in the Global Marketplace: Issues, Trends and Challenges Facing New Zealand's Sheepmeat Industry.** 1994. Available from: http://hdl.handle.net/10182/339
138. Lyne, M. **Ownership and Control of Maori Land: Some Lessons for South Africa.** 1994. Available from: http://hdl.handle.net/10182/223
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140. Sheppard, R.L. Atkins, C. **Dumping, Protectionism and Free Trade.** 1994. Available from: http://hdl.handle.net/10182/908
141. Agribusiness and Economics Research Unit. **Papers Presented at the New Zealand Agricultural Economics Society, First Annual Conference (Blenheim Country Lodge, July 1994).** 1994. Available from: http://hdl.handle.net/10182/1043
142. Agribusiness and Economics Research Unit. **Papers Presented at the New Zealand Agricultural Economics Society, Second Annual Conference: "Agriculture and the Environment".** 1995. Available from: http://hdl.handle.net/10182/964
143. Storey, G.G. **The Implications of Government Reform in New Zealand for the Canadian Agri-Food Sector.** 1996. Available from: http://hdl.handle.net/10182/996
144. Agribusiness and Economics Research Unit. **Papers Presented at the New Zealand Agricultural Economics Society, Third Annual Conference: "New Zealand Agriculture in the 21st Century".** 1996. Available from: http://hdl.handle.net/10182/962
145. Agribusiness and Economics Research Unit. **Papers Presented at the New Zealand Agricultural Economics Society, Fourth Annual Conference: "Managing Changing in a Dynamic Environment".** 1997. Available from: http://hdl.handle.net/10182/1042
146. Agribusiness and Economics Research Unit. **Papers Presented at the New Zealand Agricultural and Resource Economics Society, Fifth Annual Conference: "Public vs. Private Interests – The Role of The State in Agriculture".** 1998. Available from: http://hdl.handle.net/10182/1060
147. Agribusiness and Economics Research Unit. **Papers Presented at the New Zealand Agricultural and Resource Economics Society, Sixth Annual Conference: "Where From – Where To?"** 2000. Available from: http://hdl.handle.net/10182/1069
148. Agribusiness and Economics Research Unit. **Papers Presented at the New Zealand Agricultural and Resource Economics Society, Seventh Annual Conference: "Where From – Where To?"** 2001.

Available from: http://hdl.handle.net/10182/1070
149. Agribusiness and Economics Research Unit. **Papers Presented at the New Zealand Agricultural and Resource Economics Society, Eighth Annual Conference: "New Zealand – The International Citizen?"** 2002.
Available from: http://hdl.handle.net/10182/1086
150. Agribusiness and Economics Research Unit. **Papers Presented at the New Zealand Agricultural and Resource Economics Society, Ninth Annual Conference.** 2003. Available from: http://hdl.handle.net/10182/1091
151. Agribusiness and Economics Research Unit. **Papers Presented at the New Zealand Agricultural and Resource Economics Society, Tenth Annual Conference.** 2004. Available from: http://hdl.handle.net/10182/1090
152. Agribusiness and Economics Research Unit. **Papers Presented at the New Zealand Agricultural and Resource Economics Society, Eleventh Annual Conference, Tahuna Conference Centre, Nelson.** 2005.
Available from: http://hdl.handle.net/10182/1119
153. Fairweather, J.R. (Editor.) 2011. **Proceedings of the International Conference on Invention, Innovation and Commercialisation with Special Emphasis on Technology Users' Innovation (TUI).**
Available from: http://www.lincoln.ac.nz/Documents/ConferenceProceedingsDPpercent 20153.pdf

Technical Reports

01. Court, R.H. **An Application of Demand Theory in Projecting New Zealand Retail Consumption.** 1966.
Available from: http://hdl.handle.net/10182/3303
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