Welcome

On behalf of the Australian Agricultural and Resource Economics Society, I welcome you to the AARES 2001 Conference in Adelaide, South Australia.

It has been 14 years since the conference was last held in Adelaide. This conference appears likely to make up for that long gap in one hit, such is the calibre of the program which has been put together by President-Elect Julian Alston and the Local Organising Committee, chaired by Doug Young.

Over the next few days an impressive array of invited guests from around the world will speak on the following topics: Wine Economics, River Basin Management, Farm Finance, EU Policy Change, and Marine Reserves. The Alan Lloyd Fellow for this year is Bruce Gardner (U. of Maryland) whose address is titled "How U.S. Agriculture Learned to Grow".

The programme also includes over 150 contributed papers from members around the globe. In addition, many, if not most, of you will have attended one of the two pre-conference workshops on biotechnology and discounting.

So we welcome you and encourage you to participate fully in a productive and exciting few days, where one of the biggest challenges will be choosing which papers to attend from a world-class list of topics and presenters.

David Pannell
President, AARES

Contents

Conference Programme

Monday 22 January

8:30 – 5:00	**'Biotechnology' workshop**	*Terrace 1 & 2*
9:00 – 4:30	**'Discounting' workshop**	*Terrace 3*
5:30 – 8:30	**Delegate Registration**	*Conference Foyer*
5:00 – 6:30	**Outgoing Council Meeting**	*Waterford Room*
6:30 – 8:00	**Welcome Cocktail Party**	*Crystal Room*

Tuesday 23 January

8:00 – 10:00 **Delegate Registration** *Conference Foyer*

8:45 – 9:15 **Conference Opening** *Terrace 1 &2*

Michael Taylor, AFFA

David Pannell, Outgoing President, AARES

9:15 – 10:30 **Keynote Speaker** *Terrace 1 & 2*

Chair: David Pannell, University of Western Australia

- ***Where in the World is the Wine Industry Going?***
  Kym Anderson, University of Adelaide

10:30 – 11:00 **Morning Tea**

11:00 – 1: 00 **Invited Papers Session I**

River Basin Management *Terrace 1 & 2*

Chair: Donna Brennan, ACIAR

- ***Economic Analysis of Alternative Institutional Structures for the Governance of Water Use***
  Ray Challen, University of Western Australia
- ***Does Efficient Water Management Matter? Physical and Economic Efficiency of Water use in the River Basin***
  Mark Rosegrant, IFPRI

European Agricultural Policy Change:

Prospects and Implications *Crystal Room*

Chair: Rob Fraser, Imperial College

- ***The EU and the WTO Agricultural Talks: Constraints, Options and Possibilities for Progress***
  Tim Josling, Stanford University
- ***Transition and Integration in Europe: Implications for Agri-Food Markets and Policy***
  Johan F. M. Swinnen, EU Commission
- ***Revealed CAP Policy Preferences and Where They Might Lead***
  Ivan Roberts, ABARE

1:00 – 2:00	**Lunch**	*Boulevard Room*
2:00 – 4:00	**Contributed Paper Session A**	*(8 rooms)*
4:00 – 4:30	**Afternoon Tea**	
4:30 – 5:30	**Presidential Address**	*Terrace 1 & 2*

Chair: Garry Griffith, Past President, AARES

- ***Dryland Salinity: Inevitable, Inequitable, Intractable?***
  Associate Professor David J. Pannell, University of Western Australia

7:00 – 11: 30	**Conference Dinner**	*Boulevard Room*

Wednesday 24 January

8:30 – 10:30	**Contributed Paper Session B**	*(8 rooms)*
10:30 – 11:00	**Morning Tea**	
11:00 – 12:30	**Invited Speaker Session II**	
	Farm Finance	*Terrace 1 & 2*

Chair: Walter Armbruster, Farm Foundation

- **Peter Barry**, University of Illinois

Marine Reserves *Crystal Room*

Chair: Mike Young, CSIRO

- **James E. Wilen**, University of California, Davis
- ***The Contribution of Marine Protected Areas to Ecologically Sustainable Development***
  Graeme Kelleher, CSIRO

12:30 – 1:30	**Lunch**	*Boulevard Room*
1:30 – 3:30	**Contributed Paper Session C**	*(8 rooms)*
3:30 – 4:00	**Afternoon Tea**	
4:00 – 5:15	**Annual General Meeting**	*Terrace 1 & 2*
6:00 – 11:00	**Social Night**	*Warrawong Earth Sanctuary*

Thursday 25 January

8:30 – 10:30	**Contributed Paper Session D**	*(8 rooms)*
10:30 – 11:00	**Morning Tea**	
11:00 – 1:00	**Contributed Paper Session E**	*(8 rooms)*
1:00 – 2:00	**Lunch**	*Boulevard Room*
2:00 – 3:00	**Alan Lloyd Address**	*Terrace 1 & 2*
	Chair: Julian Alston, Incoming President, AARES	
	• ***How U.S. Agriculture Learned to Grow*** **Bruce Gardner,** University of Maryland	
3:00 – 3:30	**Conference Closure**	*Terrace 1 & 2*
	Julian Alston, Incoming President, AARES	
3:30 – 4:00	**Afternoon Tea**	
4:00 – 6:00	**Incoming Council Meeting**	*Waterford Room*

Conference Participant Identification

Various categories of participants will be attending the conference. The colour of the lanyard worn by the person will assist you to identify them.

Blue: Delegates and Speakers
Red: Workshop Attendees
White: Local Organising Committee

Pre-Conference Workshops

Monday 22 January

Agricultural Biotechnology: Markets and Policies in an International Setting

Jointly convened by the **International Food Policy Research Institute** and the **Australian Agricultural and Resource Economics Society**

Workshop Organiser: **Philip Pardey,** IFPRI

This workshop will feature a range of Australian and overseas economists, biotechnologists, and policy makers from the public and private sectors, addressing market developments and policy issues associated with intellectual property, international trade in GM products, technology regulation, and technology impacts associated with modern biotechnology.

This one-day workshop will address some of the critical biotechnology issues, the resolution of which will have significant consequences for the future direction of agriculture. Many of these issues are the subject of ongoing debate in Australia, but they all have global aspects and consequences, and it is the international dimensions of these issues that will be highlighted in this workshop.

Discounting and Discount Rates in Theory and Practice

Workshop Organisers: **David Pannell and Steven Schilizzi,**
University of Western Australia

Discounting is an essential component of economic comparisons over time, but it is still plagued by a number of practical and theoretical difficulties and controversies, inside as well as outside the discipline. This workshop will tackle discounting from a number of angles, ranging from relatively short-term private financial decisions, to public issues spanning generations. Leading economists will present reviews, perspectives and original ideas on discounting in theory and practice.

Social Functions

Monday 22 January

Welcome Cocktail Party
The pre-conference cocktail party will be held at the Stamford Plaza Crystal Room and provides an early opportunity to catch up with colleagues and friends. Drinks and nibbles will be available from 6:30 pm.

The welcome cocktail party is free for full registration delegates.

Tuesday 23 January

Annual Conference Dinner
The annual conference dinner will be held in the Boulevard Room at the Stamford Plaza from 7pm.

Wednesday 24 January

Social Night
The social evening will feature a buffet style dinner and nocturnal bush walk through fourteen hectares of rehabilitated Australian bush at Warrawong Earth Sanctuary. Attendees can experience Australian native animals, including platypus, in their native habitat and 50,000 native plants.

Buses will leave from the Stamford Plaza at 6pm to arrive at Warrawong at 6:45. Walks will commence every ten minutes from 8:30pm and take about one hour. Dr. John Wamsley will be giving an informal talk during the evening.

Invited Paper Abstracts

Keynote Speaker

Where in the World is the Wine Industry Going?

Kym Anderson
University of Adelaide

This paper addresses three questions: how well does Australia's wine industry performance since the late 1980s compare with previously and with the recent performance of its competitors abroad; what are the prospects ahead for Australian producers, given that global wine consumption per capita has not been growing yet premium wine production is expanding in many countries; and what can we learn from the current wine boom of relevance to other rural industries? In absolute terms, and relative to other Australian industries, the wine industry has done extremely well since the late 1980s in terms of export-led growth. It is now the world's second largest exporter of wine after the European Union. Relative to other New World wine export suppliers, however, Australia's trade performance is not outstanding. Exports from the United States and several other Southern Hemisphere producers also have grown rapidly in quantity and in quality, albeit from smaller bases. Given that competition from other New World suppliers, and the quality upgrading of several large wine regions in Europe, the continued prosperity of the Australian industry depends on it meeting numerous challenges. The way it is positioning itself to do that may well provide an example to other industries of how to sustain export-led growth.

Presidential Address

Dryland Salinity: Inevitable, Inequitable, Intractable?

David Pannell
University of Western Australia

New information about the hydrogeology of Australia's agricultural regions has profound implications for the economics of salinity management and the design of policy. This paper reviews a broad range of information relevant to the salinity problem in order to critically evaluate existing and prospective policy responses. It brings together issues of hydrogeology, farmer perceptions and preferences, farm-level economics of salinity management practices, external benefits and costs from salinity management, and politics. The technical challenge of preventing salinity is far greater than previously recognised. The farm-level economics of currently available management practices for salinity prevention are adverse in many situations. The off-site benefits from these on-farm practices are often small and long delayed. A conclusion of the paper is that past national salinity policies have been seriously flawed, and that the 2000 National Action Plan has positive elements but has not sufficiently escaped from the past. The two most important broad areas of change identified in this review are more rigorous analyses of proposed public investments and a greater emphasis on the development of improved technologies, both for salinity prevention and for adaptation to a saline environment.

Invited Speaker Session I (1)

River Basin Management

Economic Analysis of Alternative Institutional Structures for Governance of Water Use

Ray Challen
University of Western Australia

Evaluation of alternative institutional structures for governance of the use of water resources has in the past been incomplete and based largely on pro-market ideology rather than rigorous analysis. This is not to deny the benefits that have arisen from market-based reforms in water allocation. Rather, it is recognising that many of the issues being grappled with in relation to institutional reform relate to collective-action dilemmas and externality problems that may complicate and limit the application and effectiveness of market systems as institutions for resource allocation. In this paper, a framework is presented for addressing policy problems of institutional choice that encompasses the roles of markets, governments and other decision-making entities. Illustrative application is made to institutional reforms in management of water resources of the Murray–Darling River basin.

Does Efficient Water Management Matter? Physical and Economic Efficiency of Water Use in the River Basin

Ximing Cai, Claudia Ringler and Mark W. Rosegrant
International Food Policy Research Institute

With growing water scarcity and increasing competition across water-using sectors, the need for water savings and more efficient water use has increased in importance in water resources management. Improvement in the physical efficiency of water use is related to water conservation through increasing the fraction of water beneficially used over water applied, while enhancing economic efficiency is a broader concept seeking the highest economic value of water use through both physical and managerial measures. Physical and economic efficiency measures are both useful indicators for water management at the irrigation system and river basin level. However, the relationship between physical efficiency and economic efficiency is not always clear and the values of these measures may indicate different directions for water policy. Open research questions include, for example: does enhancement of physical water use efficiency always lead to improved economic water use efficiency? How does the changing flexibility in water allocation and irrigation technology affect physical and economic irrigation efficiency? What is the impact on physical and economic efficiency of various structural and nonstructural improvements? To explore these issues, an integrated economic-hydrologic river basin model is applied to the Maipo River Basin in Chile. A series of modeling scenarios are defined and policy implications

from physical and economic efficiencies for basin-wide irrigation water management are analyzed.

Invited Speaker Session I (2)

European Agricultural Policy Change

Transition and Integration in Europe: Implications for Agri-Food Markets and Policy

Johan F.M. Swinnen
Katholieke Universiteit Leuven & European Commission

A decade after the fall of the Berlin Wall several Central and Eastern European countries are on their way to become members of the European Union. Agriculture and agricultural policy is an important issue in EU enlargement, and vice versa, both for internal and international reasons. In fact, the prospect creates expectations, but also concerns with policy makers and farmers in East and West. Low prices and labour costs in the CEECs causes serious concerns in the EU-15, not only because of future competition from the CEEC farms, but also because of its potential impact on the CAP given WTO agreements and budgetary constraints.

This paper reviews the changes that have occurred in the agricultural and food sector of the CEECs and draws implications for the impact of EU enlargement on agri-food markets and on agricultural policy. I argue that, first, those countries which have reformed most rapidly and most thoroughly are now doing best and their reform efforts have resulted in significant recovery and efficiency improvements both in the agri-food system and more generally in the economy. Second, several factors suggest that the impact of Eastern Enlargement on the EU-15 will be less dramatic than initially feared, although some uncertainty remains. The possibility that the accession of the CEECs into the CAP will cause a conflict with WTO commitments has been reduced, but cannot be excluded for some specific commodities, depending on the CEEC supply evolution. However, the likelihood of a WTO conflict, and the impact on the CAP, will depend more on the outcome of the negotiations in the WTO Millennium Round than on enlargement. Similarly, the impact of enlargement on the EU budget depends mostly on the (political) decision on the allocation of direct payments to CEEC farmers and/or of the extent of structural funds for CEECs.

The EU and the WTO Agricultural Talks: Constraints, Options and Possibilities for Progress

Tim Josling
Stanford University

The EU will once again be in the spotlight as Agricultural talks in the WTO continue. The paper discusses the position of the EU on the key issues of market access, export competition and domestic support. It also considers the other topics that the EU has put on the table, such as animal welfare and geographical indications for agricultural goods. The emphasis is on the constraints under which the EU operates, the options that it faces in the talks and the possibilities for progress in the next three years. The conclusion is that the EU has started out from

a more accommodating position from the point of view of exporting countries such as the Cairns Group, but that it has relatively little room for flexibility as a result of domestic constraints and the enlargement of the EU. It may be some years before the CAP is fully acceptable to trading partners.

Revealed CAP policy preferences and where they might lead

Ivan Roberts
ABARE

The EU's Common Agricultural Policy (CAP) exercises important influences both within and outside the European Union. Internationally, it depresses and destabilises world prices and restricts market opportunities for non members.

Currently, the outlook for the CAP is more uncertain than at most previous times because of EU expansion eastward; potential difficulties in managing crises including mad cow disease; and ongoing constraints including those from WTO agreements.

EU agricultural policy has emphasised farm income support with a preference for regulatory 'solutions' to CAP induced supply imbalances and for using the world market for surplus disposal. Since the mid 1980s, internal regulatory measures have been used to manage the extent of surpluses at levels that the EU may consider acceptable.

Future support is likely to be between the current high EU levels and the much lower levels in the prospective members. The interaction of budget limitations and international obligations is likely to markedly influence the extent, nature and international effects of the future CAP.

Invited Speaker Session II (1)

Farm Finance

Farm Finance

Peter J. Barry
University of Illinois

This paper addresses on-going structural, market, and policy issues of farm finance. A tri-modal distribution of agricultural production firms is emerging that includes large industrialized operations, commercial-scale family farms, and small, part-time or limited resource farms. Traditional farm finance focuses mostly on the commercial-scale family farms, which rely strongly on relationship-based financial institutions who have specialized and dedicated programs for financing agriculture. These institutions contribute significantly to risk bearing and liquidity management in agriculture. They may, however, need institutional or government back-up to support these concentrated lending programs, especially when other elements of agricultural policy do not play a strong role in risk bearing.

Invited Paper Session II (2)

Marine Reserves

The Contribution of Marine Protected Areas to Ecologically Sustainable Development

Graeme Kelleher
CSIRO

This paper briefly describes the Great Barrier Reef Marine Park as an outstanding example of a large, multiple use Marine Protected Area (MPA). It then identifies the lessons that have been learned in applying MPAs to achieve sustainable development of marine ecosystems in different bio-physical and socio-economic environments around the world.

Alan Lloyd Address

How U.S. Agriculture Learned to Grow

Bruce Gardner
University of Maryland

Following decades of important but sporadic improvements in farming technology, an astounding take-off in U.S. agricultural productivity occurred. While the take-off cannot be precisely dated, it had not begun by 1930 and was clearly in progress by 1940. Moreover, beyond the oft-cited benefits to buyers of farm products as real farm prices have declined, there have occurred real economic gains to farmers in the period of rapid productivity growth. By the end of the 1950s it had become clear that real farm household incomes were rising after 40 years of stagnation. Real incomes have since risen both absolutely and relative to incomes of nonfarm households. Farmland began to rise in real value in the mid-1950s after declining in real terms between 1910 and 1950. Even the real wages of hired farm workers, which might be

thought to be most threatened by technological change, increased in real terms and relative to nonfarm wages after 1950.

Overall, the growth of productivity and income in U. S. agriculture in the 20th Century is a notable achievement. The question then is what made it happen? And, there is the further question of how productivity and farm income growth are related. Did productivity growth cause farm income growth? Or did farm incomes grow despite productivity growth? Are trends in both the result of common underlying causal factors? Could the relationship between productivity and income have gone either way depending on conditioning factors such as commodity policies and the international market situation?

Using state and county data for 1930 to 1990, the evidence indicates that the growth of agriculture as a sector is promoted by investment, farm productivity improvement, and agricultural research. These variables are of course not independent of one another, and it is not claimed that any one of them is more important than another as a separable cause of growth. Other variables that were thought likely candidates as causes of agricultural growth, notably farmers' schooling, regional and commodity specialization measures, and government commodity support programs, turn out not to be consistently significant factors.

The growth of real farm family incomes, from farm and off-farm sources together, is more directly important from the viewpoint of peoples' welfare. The surprising finding with respect to causes of family income growth is how little any agriculturally specific variables contribute to explaining differences among counties. This is true even for the counties in our sample that are most heavily dependent on agriculture. Instead, farm family income growth is explained, to the extent it is explainable, mainly by the relationship of farm to nonfarm family earnings. This relationship is taken to be attributable principally to labor market adjustments. Counties where farm family income was relatively low as a fraction of nonfarm incomes in 1960 rose significantly faster than in counties where farm and nonfarm incomes were close, and farm incomes consistently rose together with nonfarm incomes. These results indicate strongly that the economic story is one of integration of factor markets, with adjustment to a state of disequilibrium that persisted until the 1960s being largely completed by 1990.

Contributed Paper Abstracts

This year over 150 contributed papers have been submitted to the conference. The contributed papers have been organized into sessions based on subject area. The first paper will be presented at the time indicated at the commencement of each session and the following papers will commence on the hour or half hour. If the presentation of a paper is cancelled, subsequent papers **will not be brought forward.** Each paper has been allocated 15 – 18 minutes. Presentation and discussion should be completed 5 minutes before the hour or half hour to allow adequate changeover time. Chairs have been instructed to adhere strictly to the timetable so that the sessions remain synchronised. Questioners should identify themselves and their affiliation.

Contributed paper sessions will be held in breakout rooms in the conference venue. The presentation timetable can be found as a separate enclosure in your conference satchel.

Aji, Joni M. M., Maria Fay Rola-Rubzen and Peter J. Batt

Factors Influencing Farmers' Decision to Purchase Seed Potatoes in East Java

Key words: small-scale farming systems, farmer decision making

Current productivity of potato farms in East Java is relatively low. One of the factors identified for this low productivity is the use of poor quality seeds. Despite this however, most potato farmers still do not purchase seeds, but rather, prefer to source seeds from the previous crop's harvest. Given the importance of improving crop yield, it is important to determine the factors that influence East Java potato farmers' decision to purchase seeds. This study used factor analysis to examine what determines farmers' decision to purchase seeds. The results showed that lack of availability of good quality seed at reasonable prices at planting time was the most important factor influencing East Javanese farmers' decision to purchase seed.

Alaouze, Chris M.

The effect of the non-market component of standing value on the optimal forest rotation

Key words: forest rotation, non-market valuation

The non-market component of forest standing value is considered by many to exceed the value of market goods from the forest, but this part of forest standing value is usually omitted from economic models that are used to determine the optimal forest rotation. These models therefore produce erroneous results. It is argued that for the Mountain Ash forests of South - Eastern Australia, a standardised version of the above ground biomass function (AGBF) of the dominant tree can provide a useful representation of the non-market part of forest standing value. An economic model of optimal forest rotation which includes the AGBF is used to find the minimum valuation of non-market standing value which produces the result that the forest should be preserved.

Ambarawati, I. Gusti Agung Ayu, Garry R. Griffith, and Hui-Shung (Christie) Chang

Issues In Developing The Bali Cattle Industry

Key words: Bali cattle, supply chain and management

Bali cattle (*Bos sondaicus*) have had various roles in the Balinese agricultural sector. However, the role of these cattle in meat production has become more significant since the financial crisis in Indonesia in mid 1997. The high price of imported beef due to the devaluation of rupiah has pushed Indonesia to encourage the utilisation of local resources such as Bali cattle. The inter-island trade has expanded, but the potential also exists to meet a larger share of the tourist demand in Bali, currently filled by imported beef. However, there are many constraints impeding the development of the Bali cattle industry. In this paper, the objective is to identify and address these issues. The opportunities for and obstacles to developing the Bali cattle industry are considered within a supply chain and management framework.

Ballenger, Nicole and Susan Offutt

Should Governments Support Food Product Differentiation Schemes?

Key Words: product differentiation, labels of origin, market segmentation.

In today's mature food market, firms use product differentiation to convince consumers of the

unique qualities of their products, thereby justifying a higher price (and earning rent when price exceeds marginal cost) while expanding market share. Government schemes that develop or enforce regulations in support of product differentiation, such as labels of origin, as with wine, or of process-based differentiation, as with organic foods, are examples of public-sanctioned market segmentation. An important policy question is whether there are market failures that justify such intervention or whether redistribution of rent toward established or favored agricultural interests is the aim.

Bari, Maksudul and Inder Pal Singh

Regional Expenditure patterns and its Implications for the Economy: A Case study in Far West New South Wales.

Key words: expenditure patterns, regional economic analysis, Barwon-Darling

The proposed changes under the government reform program in natural resource management would affect the regional economy. An understanding of the flow of business expenditure in the regional economy, including both purchases and sales transactions performed by businesses, is one of the key factors in determining the impacts of such reform programs. This paper is devoted to fill gapes in such understanding by analysing the expenditure patterns of irrigation and other water dependent industries in the Barwon-Darling region. It also attempts to identify the underlying implications of the existing flow of expenditure patterns for the regional economy. The results of the study would assist the natural resource planners and managers to gain insights into the probable flow-on impacts of the planning options.

Beare, Stephen, and Anna Heaney

Stochastic control for managing animal and plant disease

Key words:

Managing the risks of the incursion and spread of plant and animal diseases is a key component of Australia's agricultural policy. Establishing the best mix of preventative, detection, control and eradication instruments in place presents a complex problem. The level of uncertainty associated with the likelihood and costs of disease incursions is high, and as a consequence so are the costs and benefits of a given management strategy. This uncertainty may have a considerable impact on the choice of an optimal policy response. In this paper, a stochastic control framework is developed to examine the impact of uncertainty on the choice of an optimal disease management strategy for a hypothetical animal or plant disease incursion. The key sources of uncertainty examined are the likelihood of incursion and the rate of spread. In addition, it is recognised that the likelihood that a disease is detected amongst the population is also uncertain. The management instruments considered include preventative measures, such as border controls, measures to restrict the spread of a disease, such as quarantine, and measures to increase the probability of detection. The model is solved numerically used collocation techniques.

Bell, Brian A

Trust Funds for improved governance and economic performance in developing countries

Key words: trust funds, governance, development economics.

The outstanding success of the Tuvalu Trust Fund (TTF) in providing a stream of revenue to overcome a chronic budget deficit and encourage economic self reliance has led the Government of Tuvalu to extend the trust concept to outer island development. This paper looks at the role of trust funds in economic development in Pacific Island Countries including a brief review of relevant country experience. The success factors of the TTF are outlined along with how the trust fund concept is being adapted to bottom up community based development in Tuvalu. Lastly, possible future directions are explored.

Boyd, Milton and Gary Warkentine

Initial Price Policy of Canadian Wheat Board and Declining Barley Exports

Key words: Canadian Wheat Board, barley exports, pricing policy

This study empirically examines initial barley price policy by the Canadian Wheat Board and CWB barley exports. CWB initial price (percentage of final price paid to farmers initially) for barley exported, has been declining, due to government reluctance to guarantee possible price short falls. This has resulted in lower CWB exports, higher non-CWB domestic supplies, and sometimes lower domestic price relative to world price. Proposed policy solutions include 1) a full cash up front price linked to futures prices offered to producers by CWB and 2) a full cash up front buying alternative offered to grain companies by CWB.

Brennan, John P. and Deirdre Lemerle

Economics of increasing crop cultivar competitiveness as a weed control weapon

Key words: wheat, diversity, variety

Crop cultivars that are more competitive with weeds offer a means of reducing dependency on herbicides. On the basis of trial results, economic analysis indicates that choosing crop cultivars that have stronger competitive ability against weeds can provide a clear economic advantage for farmers. In this paper, the effect of changes in seeding rate on this economic advantage is explored. The question if whether it is economic to breed for greater competitive ability is addressed by examining the economic implications for the breeding program, in terms of costs and impacts on other selection traits, of selection for competitive ability.

Brennan, Lisa, Peter Carberry and Zvi Hochman

Can agribusiness utilise better information on climate variability?

Key words: agribusiness, climate, APSIM, action research

Climate variability impacts significantly on the agricultural service sector, affecting the operations and policies of agribusiness suppliers, banking and insurance companies. Through consultation with these companies, it is clear that their business operations and policies could benefit substantially from access to enhanced processes for dealing with climate variability. Using climate forecasts and the computer simulation model, APSIM, the Agricultural Production Systems Research Unit (APSRU) is exploring whether better targeted and cost-effective agribusiness services can be provided for the benefit of agribusiness organisations and Australian farmers. In this paper we report on our experiences and learnings from our action research approach, where APSRU researchers are working alongside agribusiness staff on relevant case studies to identify the opportunities for implementation of improved agribusiness operations based on climate forecasts and use of the APSIM model.

Buckingham, Arthur, Maksudul Bari, Tissa Yatawara, Inder Pal Singh and Paramjit Kaur

Regional Economic Impacts of Adjusting Water Use to Sustainable Groundwater Yields: A Case Study in the Namoi Valley, New South Wales

Key words: groundwater, sustainable yields, regional economic analysis, namoi

Over-extraction of groundwater in some of the aquifers in New South Wales is affecting the long-term sustainability of this important natural resource. To address this issue, community driven Groundwater Management Planning process has sought to identify options for resolving the trade-offs between economic, social and environmental objectives at a regional level. Using spreadsheet and input-output models, this paper presents the assessment of regional economic impacts of adjusting water use to sustainable yields in the Namoi groundwater systems in North-West New South Wales. The study provides the scale, distribution and timing of the short-term economic impacts of limiting usage levels to sustainable yields. In aquifers where current water use exceeds the recharge rate, these short-term effects may be considered as the cost of achieving the net social benefit of sustainable groundwater use.

Butler, L.J. (Bees) and Irene Henriques

Adoption and Diffusion of Biotechnology: rbST in California.

Key words: biotechnology, adoption.

The problem of projecting future use patterns of agricultural biotechnology products in order to evaluate their potential for development and commercialization is a challenging proposition for economists. While many have attempted *ex ante* methods of projecting adoption and diffusion rates, very few have tested their *ex ante* results after the fact. We propose to use a continuous sample of California dairy producers to examine a variety of methods and models of projecting *ex ante* adoption and diffusion rates, and using *ex post* results to verify the results.

Cagatay, S. and R. Lattimore

Impacts of Trade Liberalization on New Zealand's Agricultural Supply Response: A Counter Factual Analysis

Key words: economic reform, real exchange rate, agricultural supply response

Beginning in the mid-1980s New Zealand underwent a comprehensive set of economic reforms, which were notable for their breath and sequencing. The impacts of policy changes on the real exchange rate (RER) and resulting changes in the agricultural sector and related processing industries are the central issues in evaluating the benefits and the costs of the reforms. In this paper, a counter factual analysis is developed to analyze what would have been the supply response of agricultural industries if the sectoral order, sequence and timing of unilateral trade liberalization policies had been different from what actually occurred. Four structural equations explaining the RER, the agricultural capital stock, and the supply of primary and processed agriculture were estimated using an error correction model. Dynamic simulations were performed which involved three policy scenarious. The results indicate that both the sectoral sequence of the liberalization policies and the size and timing of the implemented policies are important in terms of increasing the agricultural supply response in the post-reform period.

Cao, Liangyue, Ahmed Hafi and Nico Klijn

The specification of the length of the planning period and the terminal value of the fish stock in a bio-economic model of a fishery exploiting a long lived species

Key words:

In a dynamic bio-economic multi-cohort analysis of fishing for a long lived species there can be a significant terminal value problem. The way this problem is dealt with can have a significant bearing on optimal policy recommendations. In this study, a bio-economic model of the Southern Bluefin tuna fishery was specified to determine optimal harvests over planning periods of different length. In each case zero prices were assumed for fish stocks left over. It was found that optimal harvest levels can be affected if the planning period chosen for the model is not long enough to make the influence of the assumption of zero prices for leftover stocks negligible. Model parameter values, initial stock conditions and the policy controls all can have a significant influence on the choice of an appropriate length of the planning period. Apart from increasing the length of the planning period while maintaining the assumption of zero prices for leftover fish stocks, positive price estimates for leftover fish stocks can be used to provide end conditions on prices of leftover fish stocks.

Chapman, Lisa, Stephen Beare and Rosalyn Bell

Managing biological uncertainty in the northern prawn fishery

Given high levels of uncertainty associated with fish stocks, predetermined access rights to the fishery may not deliver the most efficient outcome. Real time monitoring of the fishery could allow effort to be expanded or decreased in accordance with a set of performance indicators. The potential for using real time performance indicators in the Australian northern prawn fishery is examined in this paper using a stochastic optimal control model of the fishery. The results indicate that the benefits of using real time performance monitoring to control fishery access may be limited. However, this result may depend critically on the relationship between surviving stocks and future recruits to the fishery.

Chaudhri, D.P. and E.J. Wilson

Agricultural Growth, Employment And Poverty: Heoretical And Empirical Explorations With Indian Data (1970-1993)

Key Words: agricultural growth, poverty, public food distribution, rural and social infrastructure, net average elasticities, impact elasticity multipliers.

There is a rapidly growing literature on the dual concern of promoting agricultural growth and reducing the incidence of rural poverty. However the analysis of the interaction of growth and poverty is an under researched area of economic policy. This paper attempts to further analyse these dual concerns in an integrated manner. A basic endogenous growth model is developed which explicitly includes poor households and a government that has to decide how to allocate resources to the provision of infrastructure and to the public distribution of food grains. The intertemporal maximisation clearly shows the trade-off the government is facing and the indeterminate outcome. The model derives five key relationships: an agricultural metaproduction function (which allows differing temporal and spatial technical progress), rural employment and wage functions, and relationships for the public

distribution of food grains and for rural poverty. These structural equations are estimated in a simultaneous setting for fifteen Indian states using eleven years of data for the period 1970 to 1993. Care is taken in the treatment of missing values, the non-stationarity of many of the state variables, the high level of dependencies between the variables (in the form of extreme multicollinearity and endogeneity) and the presence of structural change. We believe that insufficient care has been taken with these important complications in some studies. Robust structural form, net average elasticities and reduced form impact elasticity multipliers are derived. These estimates give valuable insights into the complicated interdependencies of the policy and endogenous variables. Whilst our broad conclusions tend to reinforce the findings of recent studies there are major differences in our estimates and methodology, which includes the conceptualisation, analytic specification and application of appropriate estimation techniques.

Chunlai, Chen and Christopher Findlay

The development of China's grain marketing system

Key words: China, markets, grain, policy reform

In recent years, China's grain economy has been the subject of intense study and concern. The focus has been the country's capacity to feed its population and the impact on world grain market of any shortfalls in her grain production. While careful research has shown many of these concerns to be overstated, the development of China's grain economy remains an issue of major significance. Among the many issues facing China's grain economy, this paper focuses the topic on the development of China's grain marketing system reform. It highlights the considerable regional variation in grain marketing reform, the more profound nature of the reforms in the early 1990s, the new grain marketing policies introduced in 1998, and the remaining government interventions in the system. Ultimately, the issue becomes one of how willing the government is to allow the market to play the role it is supposed to play. The most fundamental concern is that market forces may not ensure supplies at the stable prices. The imperfections of the market system and the uncertainties of producer response to the incentives they face feed into such hesitations. Nevertheless, the paper argues that the high cost to government of continued intervention sustains the momentum towards market reforms.

Coelli, Tim, Sanzidur Rahman, Colin Thirtle

Technical, Allocative, Cost and Scale Efficiency in Rice Cultivation in Bangladesh: A Non-Parametric Approach

Key words: Allocative and cost efficiency, rice, Bangladesh

Appling programming techniques to detailed data for 406 rice farms in 21 villages, for 1997, produces inefficiencies which differ substantially from the results of simple yield and unit cost measures. For the Boro (dry) season, mean technical efficiency was 69.4%, allocative efficiency 81.3% and scale efficiency 94.9%. The Aman (wet) season results are similar, but a few points lower. Allocative inefficiency is due to overuse of labour, suggesting population pressure, and of fertilizer, where recommended rates may rate warrant revision. Second-stage regressions show that large families are more inefficient, whereas farmers with better access to input markets, and those who do less off-farm work, tend to be more efficient.

Cook, David and Rob Fraser

Exploring the Regional and Size-Related Implications of Interstate Quarantine Policies for WA Fruit and Vegetable Growers

As a signatory of the World Trade Organisation Agreement, Australia has a responsibility to demonstrate the validity of any measure which restricts competition in its internal markets for food and food-related products to avoid appeals and/or retaliatory actions by trading counterparts. This paper examines the welfare implications of interstate quarantine regulations influencing the markets for mangoes and tomatoes in Western Australia using two economic evaluation techniques. One method relies on an aggregate assessment (used where cost differentials between component growing regions are small), and the other on spatial characteristics (used when cost differentials are large). By taking market size into account, it is also demonstrated that consumer welfare losses resulting from quarantine restrictions outweigh producer welfare gains in larger industries.

Cook, Venton

Measuring the value of the SA Food Industry - A Revenue Approach

To measure the value of the South Australian agrifood industry over time, food industry output, in terms of revenue along the value chain from production to consumption, is monitored. The

agrifood industry is examined at the following levels: the farm gate, processor turnover, export and import (overseas and interstate trade classified as commodity and processed products), and consumption including food retail and food service (cafes and restaurants). Results are reported annually as the SA Food Industry *ScoreCard*. The analysis indicates that in 1999-2000 the Gross Value of the South Australian Food Industry is $7.22 billion (calculated by the contribution made at export, retail and food service levels).

Cooper, Don, John Bartle,. Steven Schilizzi, and David Pannell

Can oil mallees in south west Australia be a profitable option for salinity control?

Key words: dryland salinity, oil mallee plantations, value-adding economics

Oil mallees are one of the preferred options to combat dryland salinity in the Western Australian wheatbelt, but their economics are uncertain. We compare three scenarios: on-farm mallee oil production, industrial oil and wood-based electricity production, and a combined oil, electricity and activated carbon system. Only the third option has any serious chances of being a profitable venture, with the second being the worst. The first could break even if oil yields increased from 3 to 4%. Results are sensitive to the price volatility of activated carbon and the operations cost of the cogeneration plant.

Cordina, D., J. Crean and T. Brill.

Meeting the MDBC Cap in the Barwon-Darling Catchment

Key words: water reforms, MDBC Cap, Barwon-Darling catchment

Reform to the Australian water industry has received considerable attention in recent years. This can be partly attributed to growing community concerns about environmental degradation, increasing competition from extractive water users and greater focus by governments on micro-economic reform. One of the key reforms shared across a number of States is the implementation of the Murray-Darling Basin Commission's Cap on irrigation diversions. In recent years, the Cap for the Barwon-Darling River has been exceeded and there is now significant pressure on the NSW Government to put in corrective policies to ensure that the water resources of the Murray-Darling Basin are shared appropriately between States. The purpose of this paper is to assess the farm-level economic impacts of alternative options proposed to achieve this. The paper provides an overview of alternative approaches to achieve Cap, the development of representative farm models to assess agricultural effects and a description of preliminary results obtained.

Crase, Lin, Brian Dollery and Mike Lockwood

Towards an Understanding of Inter-Temporal Transaction Costs in Water Markets

Key words: water markets, choice modelling

Markets for water entitlements and 'appropriate' pricing are often presented as the panacea for dealing with the difficulties of allocating resources in a mature water economy [see, for example, Rosegrant, 1999; Bauer 1997; Thobani 1997]. Moreover, these views are embedded in elements of the CoAG water reforms which require, amongst others, that the nexus between land and water titles be broken and arrangements for the trading of water entitlements be established. The theoretical foundation of these reforms presumes that water will be traded from relatively low-value to higher-value uses and simultaneously accomplishing the economic and environmental objectives ascribed to water resource managers. Numerous analyses have been conducted to model the impacts of entitlement markets, allocations for the environment and other recent legislative changes pertaining to water [see, for instance, Hall, Poulter and Curtotti 1993; Crean *et al.* 1998]. In general, these analyses support the market framework as a technique for allocating water as it becomes increasingly scarce. However, a relative dearth of information exists about the impact of legislative change itself on the citizenry who are required to assimilate and conform to the changing rules. This paper explores the impact of the rate of regulatory change on NSW irrigators and how this effects their decisions to engage in the market for water entitlements. Results of a conjoint experiment or choice model are presented which measures the 'value' of a more stable set of rules. These are derived from survey data collected from over 500 irrigators in the Murrumbidgee and Murray Valleys. The conjoint experiment provides the opportunity for legislators to assess the broader implications of water reforms.

Crosthwaite, Jim

Policy formulation - the duty of care and putting the farm first

The duty of care is a recent proposal which can help resolve Australia's natural resource management problems. Current proposals for the duty of care are unlikely to be effective because stiff resistance to redefinition of property rights can be expected. Analysing the problem from the perspective of the farm business is useful, because it gives a new perspective on the opportunity costs to farmers of complying with the duty of care. Proposals are made which enhance the acceptability and enforceability of the duty of care. Compensation is to be avoided.

Crosthwaite, Jim and Bill Malcolm

Case studies and remnant vegetation management

Understanding the farm business can contribute to policy development where retention of native vegetation is a public policy goal. A study of eight farms with native grasslands in southeastern Australia has been conducted. For each case study the scope for the farm business to meet family needs into the future while retaining the native vegetation has been examined. Results vary. In many cases there is such scope, while in other cases options are very limited. Public investment may be warranted in both cases. The lessons for public policy revolve around: identifying future possibilities for farm businesses, targeting policy to several different levels of the farm business, and ensuring that policy does not become 'locked in', re-orientating the farm business towards future possibilities rather than paying compensation. Exploring farm businesses in-depth has a clear future in policy formation.

Damania, Richard

Trade and the Political Economy of Renewable Resource Management

Key words: Trade, endangered species, lobbying and trade sanctions

A growing body of literature suggests that political factors are one of the major causes of environmental damage in developing countries endowed with a relative abundance of renewable resources. This has prompted calls for the use of trade sanctions to encourage sustainable resource management practices in these countries. This paper develops a model to assess the interaction between political lobbying, trade and the incentives to extract a renewable resource. It is demonstrated that in a political equilibrium trade sanctions may have effects that have not been previously identified in the literature. It is shown that if the government is predisposed to the demands of special interest lobby groups, then trade sanctions may fail to induce better resource management practices. There are circumstances where sanctions lead to greater harvesting of the renewable resource and worsen environmental outcomes.

Dodd, Alyssa, Catherine Halbrendt, Charles Nicholson, Wei Zhang, and Budy P. Resosudarmo

Farm-Level Financial Impacts of Controlling Phosphorus Loading to Surface Water: Dairy Farms in Vermont

Key words: environment and farm management

Dairy farms contribute two-thirds of Vermont's agricultural income, but are principal non-point sources of phosphorus loading to the US' sixth largest freshwater lake. A stochastic financial simulation model was used to assess impacts of implementing animal-related "best management practices" (BMP) on farms with 60, 150, and 350 cows. Reformulating feeds to eliminate P in excess of animal requirements reduced P loading and improved net cash farm income for all farm sizes. Control of milkhouse waste water was the next most cost-effective P reduction strategy. Capital-intensive liquid manure storage had relatively large negative impacts on the small farm's financial performance.

Doeksen, Gerald A.

The Importance of the Health Sector to Rural Economic Development

Key Words: rural health; health impact; community development

As leaders in rural communities strive to sustain their economic base through development activities that range from seeking value added agricultural industries to attracting technology or e-commerce business, it is imperative that the community have good health and education systems. This paper will report on research completed in rural Oklahoma that measures the impact of the health sector on the rural economy. This includes using input-output analysis to measure the direct and secondary impacts on employment, income, and retail sales. Then, the paper will briefly discuss what community leaders can do to improve health services. Finally, a budget of a health care service will be presented which demonstrates how economy of scale impacts the delivery of health services in rural communities.

Donaghy, Peter and John Rolfe

David vs Goliath: the bifurcation of public policy concerning organic agriculture and biotechnology in Queensland

The Australian organic industry has undergone recent and rapid expansion in response to growing consumer concern over food safety issues. The industry is growing at 20-30% per annum and has an annual gross value of $200 million. The Australian organic industry is vehemently opposed to the genetic engineering of foods and has requested that the Australian Government imposes a five year freeze on the import, sale and production of genetically engineered foods. In contrast, the Queensland Government is seeking to accelerate and nurture competitive bioindustries through the provision of its $270 million Bioindustries Strategy. This paper will examine the recent growth of the Australian organic industry, the potential conflicts between biotechnology and organic industry development and conflicting government policies guiding the expansion of the organic and biotechnology industries.

Duncanson, Trevor Tym and Steven Schilizzi

Drought Risk: Have Economic Benefits from Bluegum Plantations in South West Australia been Overestimated?

Key words: Drought risk, economics of tree farming

The social and environmental benefits of establishing *E. globulus* plantations in south west Australia on previously cleared farmland are reviewed. Due to their sensitivity to drought, we study how this risk may affect the return on plantation investments. Productivity reductions of up to 40% in both rotations did not result in an internal rate of return lower than the threshold 10%. These results assume that growers could sell into the international market and receive export parity prices. If this case, large reductions in plantation productivity should not discourage investment and the reported social benefits should not be greatly affected.

Dyack, Brenda and Ellen Goddard

The Rise of Red and the Wane of White: The demand for wine in Ontario, Canada

Key words: wine; demand system; information index

In this paper we present results from a two-stage dynamic translog demand system estimation of the demand for wine in Ontario, Canada. The system includes the demands for domestic and imported red and white wine. Our main concern is with the impact of information on consumer preferences. In particular, the information variables that we include are brand and generic advertising by colour of wine for domestic and imported wine; a health index which indicates the degree of media coverage in the press about the benefits and costs of wine consumption; a health index which indicates the amount of research being done on health impacts of wine; and, indicators of public policy such as ad expenditures by provincial addiction centres.

Eigenraam, Mark

The Application of Dynamic Programming to Issues of Sustainability.

Dynamic Programming allows the user to examine the temporal and spatial issues associated with alternative land management options and their impact on sustainability. Management thresholds, limits and boundary conditions have been conveyed to land holders with the objective of minimising the impacts of soil acidity. A static constraint or boundary condition on a dynamic problem is a sub-optimal solution in the long run. This paper assumes that resource (land and water) use and management follow pathways of dynamic optimisation. Dynamic programming is coupled with a stylised crop pH model (LimeIT) and used to demonstrate pathways of sustainability.

Fan, Shenggen, Linxiu Zhang, and Xiaobo Zhang

Growth and Poverty in Rural China: The Role of Public Investments

Key words: public investment, Chinese agriculture, poverty, production growth.

The study uses a simultaneous equations model and time-series (1978-97), cross-sectional (25 provinces) data to analyze the differential impact of different types of public investments on growth and poverty reduction in rural China. The results show that government expenditures on education have by far the largest impact on poverty reduction, and the second largest impact on production growth. Government spending on agricultural research and extension has the largest impact on agricultural growth, and the third largest impact on poverty reduction. The next best investment is rural telecommunications,

which gives the second largest impact on poverty reduction and the third largest impact on agricultural growth. The results also show that there are regional tradeoffs in achieving growth and poverty alleviation goals. If the government wishes to maximize its poverty reduction effects, then investments should be targeted to the western region. However, the sacrifice in growth by investing more in the western region is small. But, the government wishes to maximize the returns to growth in agricultural production, then it should definitely target the central region.

Fang, Cheng and John C. Beghin

Urban Demand for Edible Oils and Fats in China Evidence from Household Survey Data

Key words: China, urban demand, edible oils.

Using urban household-level survey data from 1992 to 1998, we provide estimates of final demand for edible vegetable oils and animal fats in three regions of China based on the LinQuad incomplete demand system. For each region, the demand for the major "staple" oil is price inelastic. The demand for "condiment" or flavoring oils is more price responsive. All edible oils and fats have positive income elasticity, but smaller than one. Using the LinQuad parameter estimates, we provide exact measures of urban consumer welfare losses associated with trade restrictions on vegetable oil imports of the order of US$ 392 million.

Farrell, Terence

Modeling Meat Quality Attributes

Recent meat demand models incorporate demand functions for cuts of meat rather than whole carcasses. However parameters for "meat quality" are seldom included in such models. Modeling difficulty arises, as meat cuts are heterogeneous in their quality attributes. Meat quality may be assessed by measurement of attributes including tenderness, juiciness and flavour. Cooking method and cooking time are the two primary factors that affect meat-eating quality. The purpose of this paper is to show how meat quality parameters relate to one another in a model for beef cuts. The model provides returns to increasing scores for tenderness, juiciness and flavour.

Fforde, Adam

Vietnamese Farmers' Organisations

Key Words:

The paper presents preliminary work from a large scoping survey of Farmers' Organisations in Vietnam. This covered both official and private bodies, and so permits comparison between various Party-sponsored cooperatives and other organisations. The sample covered provinces in the north, centre and south of the country, and generated a database with information from interviews with 1,800 households. This was complemented by extensive qualitative work, both through interviews and focus groups. Orthodox Leninist collectivisation occurred in north Vietnam in the late 1950s and early 1960s, and, after Reunification in 1975-76, in the south. Successful in south-central Vietnam in the late 1970s, cooperatives were never firmly established in the Mekong delta. After partial reforms in 1981, 1988 saw more far-reaching measures widely labelled 'decollectivisation'. However, by the late 1990s many cooperatives remained. Passage of the Cooperative Law in 1996, which inter alia introduced 'new-style' cooperatives as a vehicle for Party-sponsored rural development as well as requiring all cooperatives to operate under it, was widely ignored. The research shows that regional differences remain considerable. In the south, farmers' organisations reflect a neo-institutional economic logic, with forms reflecting varying issues, such as those to do with market failure in a technical sense. In the centre, whilst official forms are largely de rigueur they are managed with a high officially-advocated degree of 'managed democracy'. In the north, complex political manoeuvres use the shells of formal structures as a theatre for conflict and negotiation, within which economic issues play a certain part.

Fraser, Rob

Using Principal-Agent Theory to Deal with Output Slippage in the European Union Set-Aside Policy

Key words: principal-agent theory; output slippage; set-aside policy

This paper proposes modifications to the existing EU set-aside policy which are designed to alleviate the problem of output slippage associated with heterogeneous land quality by using "incentive-compatible" mechanisms drawn from principal-agent theory. Specifically, it is suggested that there should be differential reference yields based on land quality to discourage the "adverse selection" of lower quality land for set-aside, and that the scope of set-aside monitoring should be expanded to include both the quantity and the quality of land set-aside so as to discourage "moral hazard" problems. The potential of these modifications is illustrated using a numerical analysis, which is

also used to evaluate the role of a range of factors which determine the set-aside decision. Finally, an estimate of the "benefits" from reducing slippage required to justify the costs of including these modifications is provided.

Friesen, Lana

Targeting Enforcement to Improve Compliance With Environmental Regulations

Key words: enforcement, compliance, environmental regulation

By targeting enforcement efforts on specific segments of the regulated community, greater compliance with environmental regulations can be achieved. In this paper, the inspection minimizing targeting scheme with two groups is derived. Firms are moved at random into the target group, while escape from the target group occurs only when an inspection reveals the firm is in compliance. The optimal targeting scheme differs from that suggested by Harrington (1988), where firms are moved into the target group on the basis of compliance record. However, the range of parameter values for which the optimal solution is feasible is limited.

Funing, Zhong, Xu Zhigang, and Fu Longbo

An Alternative Approach to Measure Regional Comparative Advantage in Chinese Agriculture

Key words:

Domestic Resource Costs (DRC) are widely used to measure comparative advantages in production of any commodity in a country. Basically, the DRC measures the opportunity costs of producing specified goods with reference to border prices for both inputs, especially imported and/or tradable, and outputs. Once a foreign exchange rate is chosen, a Domestic Resource Costs Coefficient (DRCC) can be obtained by dividing the DRC with the exchange rate. If the value of DRCC equals one, then the opportunity costs of domestic production is exactly the same as the costs of imports, or the foreign currency earned from exports. If that value is less than one, it implies that domestic production costs are less than imports. However, there is a departure from classical Ricardo's theory of comparative advantage in the above approach. A Ricardian model requires comparing production of two goods between two countries, without counting domestic output prices and exchange rate. A country may have DRCC values higher than one for two or more products, which means it has comparative disadvantages in all these products. However, it must have comparative advantage in at least one product. The same argument applies to measuring regional comparative advantages within a country. Therefore, in this study, the ranks, i.e., the relative values, rather than the absolute values, of DRCCs of will be taken as indicators of regional comparative advantages in grain production among provinces in China. The ranks of the DRCCs of various grain crops within any specific province, which suggest the relative comparative advantages in producing various grain crops in a province, rather than the relative comparative advantages of various provinces in producing a specific grain crop will be used to show the direction of structural adjustment. Obviously the two indicators are both important in measuring China's regional comparative advantages in grain production, and a province's comparative advantages in producing various crops may be more important in determining the direction of structural adjustment in that province.

Gao,Qi-Jie

Development of Dairy Industry in China

Key words: dairy industry, integration

The Chinese dairy industry is in transition from a traditional centrally planned to a more market-oriented sector. This paper reviews the development process of dairy industry and the characteristics of different types of dairy farms existing in China. A range of factors affecting the development of dairy farming in China are analysed, which include small scale, poor management, lack of appropriate technology and effective training of dairy farmers, lack of extension and marketing services, lack of marketing incentives due to the traditional consumption pattern etc. The present situation of dairy products consumption and challenges under the market-oriented economy are also discussed. Finally the realistic alternatives in reconstructing dairy industry and relevant policies are recommended.

Gilbert, John and Thomas Wahl

Agricultural Trade Liberalization in China: A CGE Assessment Incorporating Open and Disguised Unemployment

Key words: China, trade liberalization, labour

China's accession to the WTO will require liberalization of its agricultural trade regime. This paper will examine the effect of agricultural trade reform in China using a large-scale CGE model of the Chinese economy that incorporates key structural features of Chinese labour markets

(disguised unemployment in the rural sector, open urban unemployment, rural-urban migration, and imperfect labor mobility). These features have important implications for agricultural trade reform in the Chinese context that are not captured by more traditional models.

Gilmour, Juliet and Bill Watson

An Integrated Modelling approach for assessing water allocation rules

Key words: COAG Water Reforms, Hydrological and Economic Modelling, Catchment Scale

The COAG Water Reforms is aimed at assigning new water allocation rules to rural users within catchments. Catchment Management Boards, charged with the responsibility of implementing the reforms, lack integrated approaches to assess environmental impacts and economic trade-offs between farming units at the catchment scale. This study develops an integrated hydrological-economic modelling approach for quantitatively assessing economic trade-offs between farming units. A conceptual framework, focused upon a systems modelling approach is developed, incorporating several current policy options. Linear programming is utilised in conjunction with a networked hydrological model to achieve this. The approach is applied to the Murrumbidgee catchment system.

Glauber, Joseph W. and Clare A. Narrod

A Rational Risk Policy for Regulating Plant Diseases and Pests

Key words: risk assessment, cost-benefit analysis, regulatory decision-making

This paper examines the Federal quarantine established by USDA in 1996 to prevent the spread of Karnal bunt, a minor disease of wheat. During the early stages of its regulatory strategy, USDA made extensive use of probabilistic risk assessments to determine the efficacy of various quarantine protocols. However, there was less careful consideration given to the costs and benefits of the actions. If risk had been incorporated directly into the cost/benefit analysis, different conclusions would have been drawn about the expected impact of the regulations. This paper develops a methodology for combining these two analyses to improve future regulatory decision-making.

Graham, Brett and Karen Schneider

Impacts of developments in the 'new economy' on energy outcomes in APEC

There has been rapid expansion in some countries in the so-called 'new economy' industries including information and communication technologies. In the United States, this expansion has been associated with significant productivity gains and strong GDP growth. The rate of uptake of 'new economy' technologies is potentially important for energy sector outcomes because of its impact on economywide productivity and growth levels. Because rapid uptake of these technologies can boost economic growth it can also lead to increased energy demand. At the same time, increased utilisation of these technologies is likely to lead to improved efficiency generally and therefore have a dampening effect on energy consumption. This major global trend may also create opportunities for competitive energy exporters such as Australia. The objective in this paper is to analyse the impact of the widespread use of information and communications technologies on economic growth and energy demand in the APEC region. It will commence with a definition of the 'new economy' and the role that this can play in enhancing productivity and economic growth. It will then examine the likely impacts on economic structure and the implications of these changes for energy consumption, production and trade. The analysis in the paper is based on applications of ABARE's Global Trade and Environment Model (GTEM).

Graham, Paul and David Williams

Australia's energy sector: An application of materials flows and bottom-up economic modeling

Key Words: Material flows; Mathematical Programming; Energy; Greenhouse gas emissions

Material flow models, which emphasize physical feasibility and constraints and concepts such as life-cycle analysis, have begun to be applied to energy policy issues. When combined with input from an appropriate economic model, material flow modeling could provide useful additional insights into Australian energy policy. Scenarios for the Australian stationary power generation sector are presented by integrating the materials flows-based OzECCO model of Australia's energy system with a bottom-up economic model.

Griffiths, William E, Lisa S. Newton and Christopher J. O'Donnell

Predictive Densities for Shire Level Wheat Yield in Western Australia

Key words: Bayesian prediction; prediction with uncertain regressors

Rainfall during the germination, growing and flowering periods is a major determinant of wheat yield. The degree of uncertainty attached to a wheat-yield prediction depends on whether the prediction is made before or after the rainfall in each period has been realised. Bayesian predictive densities that reflect the different levels of uncertainty in wheat-yield predictions made at four different points in time are derived for five shires in Western Australia.

Gyles, Oliver (a)

Economic aspects of some groundwater disposal options for irrigated dairy farms: A preliminary evaluation

Net costs for disposal by pumping to the Murray River, an on-farm evaporation basin, conjunctive use with surface water to irrigate pasture, and undiluted irrigation of a salt tolerant grass were estimated and compared. Total conjunctive use (TCU) is the cheapest option below 10dS/m groundwater salinity. TCU becomes more expensive than river disposal above 10 dS/m and than on-farm evaporation above 15 dS/m. Above 10 dS/m, partial conjunctive use with disposal of some groundwater by irrigating salt tolerant forage is similar in cost to river disposal and less expensive than total on-farm evaporation. Farm and regional perspectives for optimising sustainable salt management are discussed.
Key words:- Salinity, groundwater, Murray River, evaporation basin, conjunctive use

Gyles, Oliver (b)

Water use efficiency at the farm and regional level: The economics of response and the Furphy of excellence

Key words:- Water use efficiency, investment

An allowance for water use is part of the agronomic analysis implicit in the foundation of any sensible economic evaluation of crop response or change of farming system. Diminishing returns to investment in water use efficiency (WUE) imply that the optimum level of investment is determined by the price of the commodity and the cost of increasing efficiency. Given a market for water, the relevant price will be that of the least valuable commodity produced at the margin of regional resources. Until water becomes liquid gold, the farm optimum will be well short of the experimental maximum. Some farm and regional possibilities for investing in increased WUE are discussed.

Hafi, Ahmed, Fiona Alexander and Adrian Kemp.

A model of the Murrumbidgee Irrigation System: integrating on-farm water use, off-farm delivery system and the activities of the water authority

Most irrigation areas in Australia do not take into account differences in delivery losses due to evaporation and seepage. The uniform pricing of irrigation water entails some economic losses. At the same time accounting for losses can impose significant transactions costs. The purpose of this paper is to examine the potential benefits of an efficient pricing scheme in the absence of transactions costs. The model has three inter linked components: the farms in the area, an off farm water delivery system and a water authority. Two versions of the model were developed. First version represents the practice of uniform pricing by water authorities where the difference between farms in conveyance losses are ignored while in the second version water authorities are assumed to charge an efficient price that reflects the cost of delivering water, including conveyance losses to each farm. Each model version simultaneously solves for optimal prices (uniform or efficient) of water delivered to farms and the allocation of water between farms and, in each farm the optimal allocation of resources between alternative production activities and for each cropping activity the optimal mix of water use technologies. Preliminary results for the Murrumbidgee Irrigation Area show that a change to efficient pricing leads to improvements in irrigation efficiency and farm financial performance.

Heaney, Anna and Stephen Beare

Evaluating salinity management options in the Mallee irrigation area, South Australia

Key words:

The draft Basin Salinity Management Strategy released in September 2000 by the Murray Darling Basin Ministerial Council, outlines the framework for States and communities to maintain the water quality of the shared water

resources of the Murray and Darling Rivers for both productive and non-productive uses. A key feature of the strategy is the adoption of water quality targets to be met by 2015. Targets apply at the end of each tributary river valley as well as for the whole of the Basin, measured at Morgan in South Australia. In collaboration with CSIRO, ABARE has developed a modelling framework through which salinity management options implemented to meet salinity targets, such as land use change and engineering interventions, can be assessed. This modelling framework integrates the relationships between land use, vegetation cover, surface and ground water hydrology and agricultural returns. The model has been extended to incorporate the hydrological characteristics of irrigation areas. In the analysis presented here, the model has been used to evaluate salinity management options in irrigation areas of the Mallee zone in South Australia. These management options include moving irrigation areas away from the River Murray and retiring irrigation areas from productive use. The results from the analysis include changes in predicted salt loads and salt concentration of surface water flows, the area of high water tables, and the estimated benefits and costs to agricultural production of managing salinity.

Henderson, Ben B.

Estimating the Technical Efficiency (TE) of Western Australian (WA) Broad Acre Farms

The purpose of this paper is to investigate the spread of Technical Efficiency (TE) of broad acre farms in WA, and to compare the estimates generated by two different efficiency estimation techniques: a non-parametric technique known as data envelopment analysis (DEA) and a parametric technique known as stochastic frontier analysis (SFA). Three samples corresponding to the main agro climatic regions of the WA wheat belt were analysed. The TE ratings produced by the two techniques were not significantly different in two out of the three regions examined. The information provided by this project will aid in the targeting of Research and Development and Extension (R&D&E) expenditure and increase the understanding of the latest performance appraisal techniques.

Henderson, Tracy M.

R&D expenditure, R&D evaluation, and the advent of collaborative R&D. With reference to the Australian sugar industry.

Key words: R&D, research evaluation, collaborative research

Australian agricultural and natural resource research, development and extension (R&D) activities have been and will remain important to economic growth and natural resource management. Historical R&D expenditure data illustrate the evolving nature of R&D over the past century, and the relatively recent emergence and growth of collaborative R&D within Australia, and within the Australian sugar industry. The value and shortcomings of existing economic R&D evaluation techniques are presented, with particular reference to the evaluation of collaborative R&D. Collaborative R&D as advocated by the Cooperative Research Centre (CRC) Program is considered, and the expected benefits of developing a holistic method of evaluating the process and outputs of collaborative R&D are highlighted.

Hill, Christine M., Tissa Yatawara, and Mark Foreman

Economic impacts of environmental flows in the Adelong Creek Catchment, NSW

Key words: economic modelling, unregulated streams, Adelong Creek catchment

Efficient management of water in unregulated systems is essential in meeting current and future needs of water users and the environment. Volumetric Conversions convert current area based licences into volume based licences as an integral part of the new management process. Hydrology modelling determines the Daily Extraction Limits for different flow conditions in each management rule proposed for meeting environmental objectives in the catchment. The case study is the Adelong Creek Catchment, an unregulated river catchment in southwestern New South Wales. Economic and hydrology modelling assesses the impacts of proposed extraction rules, designed to meet environmental flow objectives, on water availability in the catchment. A spreadsheet based optimisation model was developed to assess the impacts of different flow management rules on the regional agricultural economy. The suitability of this approach will be assessed for application to other unregulated stream catchments.

Hoque, Ziaul, Martin Dillon, Bob Farquharson and Greg Kauter

Modelling and evaluating alternative management strategies for insecticide resistance in the Australian cotton industry

Key words: cotton, insecticide resistance, and economics

The issue of insecticide resistance to *Helicoverpa* insects is of increasing concern to the Australian cotton industry. In this paper we begin to consider this issue using bio-economic modelling and analysis. We develop a number of management strategies at the farm level within an integrated resistance management framework. The HEAPS entomological simulation model is used to evaluate the impacts of alternative strategies for insect control. The method of analysis investigated in this paper involves dynamic optimisation techniques based on predicted stock and flow outcomes from the simulation and other models.

Hughey, Ken, Geoff Kerr, Ross Cullen, Ali Memon

Evaluation of Externality Management Instruments in Marine Fisheries

Key words: New Zealand, fisheries, externalities, decision support system

New Zealand marine fishing activities create many types of environmental externalities, which by law must be internalised. Selection of best internalisation instruments can be aided by following a hierarchical decision process, which first screens the universe of instruments against implementation criteria to establish the feasible set. Instruments in the feasible set can be evaluated against a range of environmental, Treaty of Waitangi, economic, socio-cultural and management criteria. This approach to selection can be formalised in decision support software to provide a useful tool for fisheries management agencies.

Jacobsen, Ben and Thilak Mallawaarachchi

Policy Issues in Protected Area Management: An Examination of Dugong Protection

Key words: nonpoint source pollution, marine protection, land use policy

Threats to dugong survival include direct mortality from boat strikes, drowning in nets and loss of habitat. Dugong sanctuaries were introduced in 1998 to protect declining dugong numbers by recognising important seagrass habitat areas. Nonpoint source pollutants such as dissolved nutrients, pesticides and suspended sediment have the potential to affect the species composition of seagrass and the extent of seagrass beds that support dugong. We explore the nature of pollution costs to society and their implications on land uses in catchments adjacent to these protected areas. Policy options available to mitigate social externalities are examined recognising the influence of market failure.

James, Sallie

Consumer attitudes to GM foods: some preliminary results from Western Australia

Key words: genetically modified food, consumer attitudes, choice modelling

Numerous qualitative studies have examined consumer attitudes towards genetically modified foods. This research adds to those studies by using choice modelling methods to examine the extent to which Western Australian consumers are willing to pay to avoid GM foods, if at all. The questionnaire asked respondents to choose between hypothetical baskets of foods with different attributes before asking them explicit "willingness to pay" questions. The fieldwork on which this paper is based has only recently been completed, and so the results are preliminary. However they appear statistically robust and consistent with previous findings. The presentation will include an outline of the survey and a summary of results.

Jarratt, Ian

Demand for, and supply of, farmer association services in Queensland

Key words: representation, farmer associations, demand/supply

In Queensland and other states, numerous industry associations represent the interests of, and provide other services for, industry/farmer members. Associations vary greatly in: functions undertaken; focus, priorities, resources available, size, affiliations with other associations, etc. This paper uses data from a survey of 68 farmer associations and surveys of farmers in several industries to examine the demand for, and supply of, farmer association representational and other services in Queensland. It also describes and explains current trends in the number, structure and operations of associations.

Jayasuriya, R. and J. Crean

Evaluation of Environmental Flow Rules in the Murrumbidgee Valley

Key words: environmental flow rules Murrumbidgee

In recent years, there has been both more widespread evidence of the declining health of many of NSW's rivers as a result of increased irrigation extractions and increasing community concerns about environmental issues. This has led to a greater focus on the need to re-balance in-stream and consumptive uses of water. In NSW, the issue is being approached mainly through the introduction of environmental flow rules across regulated catchments with the nature of such flow rules determined by community based Water Management Committees within an overall framework set by Government. A key issue in deciding on appropriate environmental flow rules is not only the ecological benefits that arise but also the trade-offs associated with re-allocation in terms of reduced production from irrigated agriculture. This paper looks at the nature of this trade-off in the Murrumbidgee catchment. A combination of linear programming and hydrology simulation modelling is used to assess the impacts on agriculture from the implementation of different flow scenarios as identified by the Water Management Committee for the Murrumbidgee Valley.

Jiang, Jian, Nicholas E. Piggott and Michael K. Wohlgenant

Trade Policy Changes in China: Implications for the U.S. soybean Sector

Key words:

Soybean farmers in the U.S. produce almost half of the world's supply of soybeans and are heavily dependent on exports. Recently ending stocks of soybeans in the U.S. have been increasing, contributing to the recent low prices. The expanding Chinese market for the soybean complex represents a potential bright spot to U.S. producers. However, China's soybean complex is subject to changes in governmental controls, particularly in trade policies (tariffs and quota) and taxation structure (Value Added Tax). This paper investigates the impact of possible trade policy changes in China's soybean complex and how this might affect the U.S. soybean industry and China itself.

John, Michele, Ross Kingwell, Steve Schilizzi and David Pannell

The economics of lucerne as an option for dryland salinity control in low rainfall environments

The replanting of trees and other high water use perennial plant options has been the major focus of dryland salinity management in recent times. It is clear however, that unless these options are taken up on a very large scale, little can be done to slow down or control ongoing land salinisation in Western Australia. Currently, there are very few options for salinity management in low rainfall agricultural environments (less than 320mm). Using a whole farm bio-economic analysis, this paper reviews the potential production, profitability and water use of lucerne (Medicago sativa L.) within a phase farming system in the low rainfall eastern wheatbelt of WA.

Johnson, Robin

Further reflections on Williamson's New Institutional Economics

Key words: institutional economics, Williamson, North and Buchanan

Abstract: Williamson gave a keynote address to the Sydney conference in January 2000. His approach has implications for both private organisations and public organisations. This paper focusses on the implications for government organisation and policy formation. The approach is based on the recognition of different outcomes from different forms of organisation with different governance structures. It recognises the presence of a number of transaction costs that prevent the pure model of competition from operating in firms. Other authors like Dixit and Horn have applied the theories to government organisation. There is a new recognition of the role of transaction costs in policy makng institutions. These constructs enable the policy forming and delivery process to be identified separately from the political process. Political institutions like election and party systems need to be understood and recognised for what they are; but once decisions are made there is another sequence of events to be considered in the implementaion of a given policy decision. This paper thus offers a number of observations on policy making in Australia and New Zealand from an institutional point of view and suggests an evaluation process of past policies which reflects these concerns.

Jones, Ann and Nicola Lansdell

Environmental labelling: theory and practice

Key words environmental label, regulation

The use (and misuse) of environmental marketing, including environmental labels, has become an increasingly important issue for firms, government and the broader community.This paper outlines existing environmental labelling practices in Australia and provides insights into how these potentially influence consumers' and producers' choices, and thus affect environmental outcomes. The paper discusses the features that environmental labels need to have if they are to facilitate the effective operation of markets and provide environmental benefits

Kanti Kundu, Tarun and Isao Kato

Economic Effects of Land Infrastructure on Agricultural Production: A Study in a Northwest Area of Bangladesh with Special Reference to Farm Performances.

Key words: land infrastructure, rice productivity, profitability

We analyse how and to what extent land infrastructure affects productivity and profitability of High Yielding Variety (HYV) Boro rice production in Bangladesh. In our study, "land infrastructure" refers to some basic physical characteristics and facilities of farmland such as farm size, land fragmentation, and irrigation & drainage systems. Our empirical study reveals that in small, fragmented farmlands, production cost is higher, productivity is lower and profitability is marginal. While weak land infrastructure practically discourages the operation of modern agricultural facilities such as irrigation ones, usually large farmers benefit by them, if available. Our study also makes some policy prescriptions to approach these farm problems.

Kapa, Maximilian M. J., Maria Fay Rola-Rubzen, and Martin Bent

Models of Small Ruminant Production in Small Scale Dryland Farming Systems in West Timor, Indonesia

Key words: livestock production systems, production model

Many farmers in West Timor operate small-scale mixed crop-livestock farms. In most of these farms, productivity of livestock production systems is quite low. There is, however, a potential to improve the contribution of livestock to total household income. Breeding and fattening are two activities that farmers could undertake to improve their livestock production systems. To examine the feasibility of these production systems, a study was conducted in three regencies in West Timor. Models of small ruminant production systems were constructed. The production model included economic as well as biological parameters such as age of puberty, age at first mating and age at first kidding. Results of the study indicated that both enterprises would yield positive returns. The financial indicators all showed favourable returns from these investments.

Kemp, Adrian, Fiona Alexander and Ahmed Hafi

Benefits of increased irrigation efficiency in the Murrumbidgee Irrigation Area

In recent times there has been increased focus on the potential benefits of improved water use efficiency in irrigation regions. In this paper, ABARE's model of the Murrumbidgee Irrigation system which incorporates farms in the area, the off farm water delivery system and the water authority is used to measure the extent to which these benefits may be realised using known irrigation technologies both on- and off-farm. Three scenarios were analysed: widespread adoption of twin furrow irrigation in horticulture, inclusion of water reuse system on-farm and replacement of dilapidated earthen and concrete delivery channels with pipes. Adoption of efficient irrigation technologies were found to result in an increase in water use on-farm, a decrease in diversions from the river and decreases in both surface and sub-surface drainage. The overall economic benefits from the adoption of efficient irrigation technologies may be greater if the environmental benefits from reduced diversions and drainage are also to be considered. The overall economic benefits need to be considered particularly in the evaluation of cost and benefits of refurbishment of irrigation infrastructure.

Kerr, Geoff

Contingent Valuation Elicitation Effects: Revisiting the Payment Card

Key words: contingent valuation, payment cards, efficiency

Payment cards, which identify upper and lower bounds on individual willingness to pay, are one approach to improve efficiency over the popular dichotomous choice approach to contingent

valuation. This paper reports a split sample test of the impacts on benefit estimates and efficiency arising from differences in the numbers of divisions on payment cards. Prior expectations were for increased cell numbers to improve efficiency, but that efficiency gains would eventually be offset because of increased response variance as cell numbers increased. Contrary to prior expectations, parameter estimates, standard errors and benefit measures were invariant to cell numbers.

Kerr, Geoff, Basil Sharp, and Paul White

Non-marketed Impacts of Groundwater Extraction

Key words: contingent valuation, water management

Competition for the groundwater resource is often intense, but little attention is sometimes paid to the values derived from extra-market uses of the resource. This paper presents the results of three valuation studies undertaken in New Zealand. Two studies assess the values obtained by the community from management of groundwater abstractions to preserve spring, river and wetland flows. The third study measures willingness to pay for domestic water quality. Results show that the community can place high values on these items, which need to be considered in developing water supply and management options.

Kingwell, Ross and Brad Plunkett

New Generation Co-operatives in Australia: Principles and Practicalities

Key words: value-adding, new generation co-operatives, supply chain management, corporate governance

Agro-industrialisation and a reduced role for statutory marketing pose new challenges for the farm sector. Formation of co-operatives is one possible response. This paper describes how principles embodied in new generation co-operatives (NGC) overcome capitalisation and governance problems of traditional Rochdale co-operatives. The NGC is not a magic pudding but a strategy to exploit co-operatives' competitive advantage of efficient delivery of quality-assured product. Drawing on a few Australian case studies, the paper discusses the incorporation of these principles in co-operatives in Australia. Whether the incentives that favour adoption and utilisation of these principles in Australia are sufficient to overcome impediments to their use is also discussed. On balance, it appears likely that in many regions and in many industries, investment in new co-operative endeavour and adoption of these principles will initially often be based on niche market and small scale investment opportunities.

Kularatne, Dailin

Evaluating the economic benefits of salinity management in irrigated agriculture

Key words: benefit–cost analysis, salinity management, GIS

Salinity management in irrigated regions has become a significant challenge for rural communities, agricultural industries and the governments. In recent years there is a considerable policy and community interest in evaluating the benefits and costs of salinity management programs. Economic evaluation supported by GIS analysis allow us to see how and where the profitable achievements are being made and also where further work is required for more beneficial results. Using the GIS and the Benefit-Cost analysis this paper attempted to evaluate the major economic benefits of the Shepparton irrigation region land and water salinity management plan, which considered as one of the most successful salinity management plans in irrigated regions

Letcher, R.A., W.D.Watson and N.Hall

An integrated model for water allocation in the Namoi River: economic module

Increasing pressures on water resources and associated cuts in allocation currently threaten many irrigators in the Namoi River catchment. In particular, cuts to groundwater allocation in many zones are expected to have significant negative social and economic impacts. Changed access to off-allocation water has been seen by many in the catchment as one possibility for mediating the impacts of these cuts. This paper discusses water allocation problems in the Namoi River catchment and the way in which off-allocation water may be utilised under various management strategies. A conceptual framework for an integrated economic and hydrological model for considering these options is developed, and the economic module is presented.

Lindner, R.K., M.P. Burton, S. James, and J. Pluske,

Identity preservation, market segmentation and market power: welfare effects of GM technology introduction in agriculture.

Key words: GM technology, market segmentation, consumer welfare

Using a simple model of the world canola market, this paper explores the consequences of the introduction of GM canola on prices, production and consumer welfare. In particular, the model contains heterogeneous consumers who differentiate between GM and non-GM canola, but who can be captured by the GM market if the price discount for GM is sufficiently large. This leads to market segmentation, with the size of price differentials determined by identity preservation costs. A particular feature of the model is the appropriate measurement of consumer welfare changes when the novel good is seen as inferior. The ability of the technology provider to extract rents through the use of technology fees is also explored, and the implications for market equilibrium and social welfare identified.

Ling, Bith-Hong

Measuring Wine Market Performance in the European Union

Key words: wine, market performance, constant market shares (CMS) approach

The EU traditionally has a leading position in the global wine industry. Its wine sector has been highly regulated by market interventions and support measures. Following trade liberalization in accordance with the WTO agreements, however, the EU protected wine sector is opening to considerably foreign competition. Even though the majority of the EU wine imports are intra-EU trade, the market share of foreign wines is significantly increasing from 4 in 1989 to 16% in 1997. The purpose of this study is to analyze the competitive performance of EU and non-EU wines in the European common market. The constant market shares (CMS) approach is used to capture the structural and competitive factors causing the change pattern of the EU wine trade for the period between 1989 and 1998.

Loch, Adam, John Rolfe , Jill Windle and Jeff Bennett

Irrigation Development in the Fitzroy basin-assessing the environmental tradeoffs

Key words: choice modelling, irrigation, environment

The Fitzroy basin in Central Queensland is one of the largest in Australia. There is increasing demand for water resources, particularly for irrigating cotton and other broadacre crops. The Queensland Government, through the Water Allocation and Management Plan for the Fitzroy, is identifying where the limits to future development might be set. This paper describes the development of a Choice Modelling application to assess the environmental and social tradeoffs that might be associated with increased irrigation development. Of particular interest are the framing effects associated with valuing impacts in separate sub-catchments compared to the basin as a whole.

MacAulay, T.G., G. Hertzler and S.P. Marsh

Modelling Vietnamese households: a simple economic model of a village

Key words: village economics, household economics, Vietnamese agriculture

Following the reforms of *doi moi*, household farms in Vietnam are being affected by policies which are implementing land, financial and trade reforms. The nature of agriculture in Vietnam is such that household farms operate within and are constrained by the activities of their location within a village. Modelling household farms to analyse the effects of changing policies needs to account for the spatial links between farms in relation to labour, inputs and produce, and the constraints that operate on production decisions in the context of a village. In this paper we develop a conceptual household model of Vietnamese farms at the village level, to develop a simple economic model of a village.

MacDonald, Ian

The Importance of Pre-commitment in International Environmental Agreements

Key words: game theory, international environmental agreements, pre-commitment

In the face of transboundary pollution externalities, cooperation in regulatory efforts between countries is required to move the economy to the optimal outcome. Existing

research in this field concludes that such co-operation is unlikely to occur because of the free-rider problem. This paper introduces the institution of international treaties and shows that a cooperative outcome supported by a treaty is sustainable. One such treaty requires countries to reduce their pollution levels by a common percentage from the non-cooperative benchmark level, but only if all countries sign it. Under such a treaty arrangement, welfare improvements are generally significant.

Malcolm, Scott A.

Sequential Land Acquisition Decisions for Nature Reserves under Acquisition and Population Uncertainty

Nature reserve planning models to maximize species viability are typically formulated for a single period. In practice, however, parcels must be acquired over time. The status of a parcel may change due to conversion to alternate land use. Populations of species to be protected may change, as well. A model that maximizes species protection with annual budget constraints is proposed where parcels available for set aside have time-varying probabilities of being available for acquisition and populations. Runs on hypothetical data show that solutions differ from the single period model even for small deviations from certainty of acquisition in future periods.

Mallawaarachchi, Thilak, Mark Morrison and Russell Blamey

Ethical Design of Stated Preference Questionnaires: Results from a Split-Sample Test

Designers of stated preference studies have placed an emphasis on removing all 'hypothetical' elements from questionnaires. A potential problem with this emphasis is that it can unwittingly increase the hypothetical nature of the survey, as well as necessitating the use of ethically questionable statements. In this paper, we conduct a split sample test of the appropriateness of admitting that alternatives evaluated within a choice modelling questionnaire are hypothetical. Minor evidence of strategic behaviour by a small proportion of the sample (about 5%) was identified; however the results indicate that welfare estimates were not affected by designing the questionnaire in this way.

Mallawaarachchi, Thilak, Mark Morrison and Russell Blamey

Determining the community value of peri-urban land: The significance of environmental amenity and production alternatives.

Key words: choice modelling, non-market valuation, land allocation

Expanding urban areas such as Queensland's Sunshine coast face growing land use conflicts among urban, agricultural and conservation uses. Private allocation decisions often exclude non-use value of environmental benefits leading to both socially undesirable and economically inefficient outcomes. We present the results of a choice modelling study in the Sunshine coast to estimate community values for peri-urban land in production and conservation. We examine the implications of the value estimates in the optimal allocation of land for sugarcane on the basis of total economic value from all land uses including the preservation of unique and threatened vegetation.

Mallawaarachchi, Thilak, George Rayment, Freeman Cook and Mike Grundy

Externalities in cane production and environmental best practice

Key words: Externalities, sugar industry, land management

Management of environmental externalities of agricultural production has become a necessity to attain sustainable resource use and efficient use of resources. In this paper we identify sources of externalities in Australian sugar cane production and examine ways to enhance greater environmental compliance by canegrowers who have agreed to a voluntary Code of Practice for sustainable cane production. The rationale for developing best-practice management options to mitigate environmental consequences of cane farming is explored using land management options for cane production in acid sulfate sensitive soils in the northern NSW coastal region as an example.

Marchant, David

Personality Traits, Financial Risk Management Competencies, and Dairy Farmers

Key words:

It is believed that personality traits, as expounded in the Five-Factor Model of personality, influence

objective performance data with respect to various occupations. It is hypothesized that some dairy farmers in S.E. Queensland will, by virtue of their personality traits, be more open to changing circumstances in the vastly different business environment of the deregulated dairy industry. By examining the personality traits of dairy farmers, and linking the possession of certain personality traits to either the possession of, or the ability to acquire, a pyramid of financial risk management competencies, it is hypothesized that some farmers' competencies will be able to be upgraded easily, that another group will need to outsource services at particular levels on the pyramid (since they won't have the ability to upgrade their competencies), and that a third group may be able to upgrade their competencies through education. These findings will have implications for the allocation of resources in industry restructuring programs.

Marchant, Mary A.

International Trade And Foreign Direct Investment By The U.S. Food Processing Industry

Key Words: trade, foreign direct investment, processed foods

Trade and foreign direct investment (FDI) are principal strategies to access foreign markets. As the world becomes increasingly interdependent, the linkages between these two strategies become increasingly important. Processed foods are the fastest growing market for U.S. agricultural exports and Asian markets are where exports have grown fastest. Additionally, foreign affiliate sales have grown faster than exports. A key question regarding competitiveness is whether FDI displaces or enhances exports? The overall objective of this research is to model the relationship between U.S. FDI and exports for processed food products and to determine whether they are substitutes or complements.

Marsh, S.P. and T.G. MacAulay

Land reform and the development of commercial agriculture in Vietnam: policy and issues.

Key words: transition economies, land use, development economics

Over the last decade, following the *doi moi* reforms, the Vietnamese government has formally recognised the household as the basic unit of production and allocated land use rights to households. Under the 1993 Land Law these rights can be transferred, exchanged, leased, inherited, and mortgaged. A 'land market' is emerging in Vietnam but is still constrained for various reasons. Additionally, lack of flexibility of land use is an issue. As Vietnam moves into the world market and reduces trade barriers in line with ASEAN requirements, farmers are becoming increasingly vulnerable to falling incomes because of lower prices for their produce. This paper gives an overview of land reform policies, issues related to these, and discusses challenges facing Vietnamese agriculture as it strives to move its household farms from subsistence to a more commercial base.

Manson, Andrew

An overview of public intervention in the primary and resource sectors of the South Australian economy

Keywords: primary industries, resources, public policy, resource allocation

Allocating public resources in an economic development context across a range of primary industry and resource issues requires, among other things, a rigorous framework and a means of communicating economic information to decision makers that can be effectively absorbed and applied. In this paper, a prioritisation framework and its application from both a project quality and a resource allocation perspective are discussed. The main elements of the framework include a market failure screen, cost sharing based on a 'beneficiary pays' principle, and information on the economic impact of potential investments utilising the Monash MRF general equilibrium model. Results from applying this prioritisation framework in Primary Industries and Resources SA are tabled and discussed.

Marsh, Thomas L. and Nicholas E. Piggott

Impacts of Food Safety on U.S. Meat Demand

Since the early 1980's an increasing number of product recalls in the U.S. meat industry have occurred. Furthermore, there have been distinct changes in the makeup of these recalls with the trend in the poultry and pork being more substantial than beef. This paper investigates the impacts of product recall events on consumer demand. The Generalized Almost Ideal demand system and a Rotterdam model are used to quantify impacts of meat recall events on demand and to examine the fragility of estimates across models. Finally, alternative econometric estimators are explored to impose inequality restrictions such as curvature on demand models.

McCann, Laura

Transaction Costs of Agri-Environmental Policies in Vietnam

Key words: agri-environmental policies, transaction costs, Vietnam

Vietnam faces a number of important environmental and resource issues including deforestation, loss of biodiversity, and water and air pollution. In developing countries the conflict between growth and protecting the environment is particularly acute. This paper provides an overview of existing agri-environmental policies and institutions in Vietnam. It then analyses policy instruments that have been employed to reduce pesticide pollution and discusses the factors affecting the magnitude of transaction costs associated with those policies. A major factor is the large number of micro-enterprises involved, both farms and input suppliers.

McCorriston, Steve and Donald MacLaren

The Trade Distorting Effect of Single Desk Exporting State Trading Enterprises

Key words: STEs, single desk, export distortions

State trading enterprises (STEs) may be high on the agenda in the forthcoming WTO negotiations on agricultural trade. Much of the concern of many countries appears to be that the existence of STEs distort competition on export markets and act in a manner similar to the use of export subsidies. It is shown in this paper, *inter alia*, that the trade distorting effect of STEs depends on the specification of the underlying benchmark against which to gauge their impact, i.e., whether domestic and/or world markets are characterised as being competitive or oligopolistic.

Monjardino M., D.J. Pannell, S. Powles

The economics of integrated weed management: a multi-species approach

Keywords: multi-species, model, herbicide-resistance, IWM

Weed infestations in agriculture usually consist of a number of co-existing species. In the Western Australian wheatbelt, ryegrass and wild radish frequently co-exist and vastly dominate over any other weeds. Both species now widely exhibit herbicide resistance such that farmers no longer can rely solely on herbicides for effective weed control, but rather need to combine a whole range of chemical and non-chemical methods (IWM). Hence, a multi-species version of the bio-economic RIM (Resistance and Integrated Management) model has been developed to deal with the complexities involved in the integrated management of ryegrass and wild radish over time.

Morrison, M. and J. Bennett

Transferring Environmental Value Estimates across NSW Rivers

Key words: choice modelling, benefit transfer, rivers

Information regarding the value of environmental impacts of alternative water uses in NSW rivers is an important input into the Water Reforms process being undertaken in that state. To generate such data on an option by option, river by river basis, the Choice Modelling technique is employed to inform a benefit transfer process. CM data were collected from respondents in six river catchments. The six rivers were selected to produce the "source" data on environmental values because of their status as "representatives" of the variety of river types across the state. Environmental values are estimated as a function of the physical characteristics of the six rivers and the socio-demographic characteristics of the catchment residents. Patterns of similarities and differences are used to generate a benefit transfer model that can be used to provide environmental value estimates for rivers across the whole state.

Myers, Laurel

The role of economists in formulating Australian agricultural policy in the 1960s

The profession of agricultural economics became accepted in Australia as a legitimate field of applied study by the mid 1950s. The fledgling discipline faced many obstacles and endured much criticism from farmers. In the1960s, the emphasis in agricultural policy shifted from income security and price stability to production and efficiency objectives. Australian producers looked to overall domestic expansion to achieve economic growth and diversification. Prices and incomes fluctuated during the 1960s but by the end of that decade, farmers' real incomes had fallen due to either loss of markets, inefficiency or overproduction. Agricultural economists played a significant role in the widespread criticism, and continuing debate about agricultural policy. Many agricultural economists became highly influential members of government agencies, industry bodies and departmental

divisions, where they often had important roles in policy formulation.

Nanere, Marthin and Iain Fraser

Total Factor Productivity (TFP): Weak Sustainability Approach

Key words: undesirable outputs, total factor productivity, productivity growth

Analysis of agricultural production generally ignores the undesirable outputs (such as off-site costs of soil erosion) that are jointly produced with desirable, marketable outputs. In this article we present the results of research incorporating national level data for undesirable outputs of soil erosion with conventional data for broadacre agriculture from the period of 1953 to 1994. Following the approach introduced by Repetto *et al.*, a revised TFP index is estimated. Using the best available data on the off-site costs of soil erosion our results show that the revised estimates of productivity growth are higher than the conventional ones especially when the damage costs per ton are assumed to have remained constant. This can be explained by the fact that the rate of soil erosion grew more slowly than output or given output increased or stayed constant, there was a decline in the rate of soil erosion.

Naughten, Barry and Ken Noble

Least cost contributions to meeting the 'Mandated' target for renewables-based electricity generation

Background is provided on the Government's 'mandated' target policy for eligible new and renewable electricity generation technologies. Australian MARKAL, with a recently updated electricity supply sector, was used to model achievement of this target at least cost, the desired effect of the proposed system of tradable certificates. This analysis indicates the contributions from the eligible technologies over the period 2000-30, the consequent additional resource cost and associated reduction in CO2 emissions from the national energy system. It also indicates the impact of 'portfolio' approaches in which particular designated technologies (wind power and photoviltaics) are allocated minimum shares of the target.

Nielsen, Chantal and Kym Anderson

How do agricultural policies in Europe affect the size and distribution of global benefits from GMO technology?

Key words: GMOs, benefits of R&D, trade policy

Genetically modified crop technology is offering productivity growth to farmers and in some cases reduced environmental damage (eg less pesticides), but other perceived environmental risks and adverse consumer reactions are causing farmers in some countries not to adopt this new biotechnology. This paper uses a well-received empirical model of the global economy (GTAP) to quantify the effects on production, prices, trade patterns and national economic welfare of selected countries enjoying an assumed degree of farm productivity growth from adopting GMO technology. It focuses on the effects of Western Europe not adopting GMOs and shows how much the consequences of that choice for welfare in both Europe and other regions depends on the existing price-distortionary policies in Western Europe.

Nordblom, Tom, Randall Jones and Richard Medd

Best Efficacy-Targeting Strategies for herbicides? A simulation analysis

Herbicide labels recommend doses sufficiently large to achieve high rates of efficacy under a range of conditions. Users may not apply doses greater than recommended; and where allowed to apply less, do so without quantitative guidance. Simulation models explore long-run biological and economic outcomes of fixed label doses and strategies keyed to density of weeds in “best fixed-dose” (BFDS) and “best efficacy-targeting” (BETS) modes, at different spray water volumes. The latter strategies were better than max label rates in terms of mean current gross margins, mean net present values of current and future benefits and costs of weed management, expressed as Hamiltonians keyed to weed seed banks, and in terms of lower overall herbicide use. BFDS have further practical advantage in simplicity and lower information requirements for the user, BETS in tailoring applications to specific field environments.

Nordblom, Tom, Matthew Smyth, Anthony Swirepik, Andy Sheppard and David Briese

Biological control for Echium species of pasture weeds in Australia, including Paterson's curse / Salvation Jane / Riverina bluebell: simulation of insect attack, spread and economic benefit streams for benefit-cost analysis

Over 400 releases of insects targeting *Echium* weeds are established and spreading in southern Australia. With data on release dates and locations, weed density and stocking rates by district, and estimates of insect attack and spread, a benefit / cost analysis is developed for the $14 million research and development biological control program begun by CSIRO in 1972. Annual benefits are projected to rise from near zero in 2000 to some $73 million by 2015, based on a value of $8/DSE. The discounted (5%) NPV from 1972 to 2015 is projected at $259 million, for a BCR of 14:1 and 17% IRR. The NPV for the 1972-2050 period is estimated at $916 million, for a BCR of 47:1 and 19% IRR.

Odom, Doreen, G.R. Griffith and J.A. Sinden

Using Aerial Mapping to Analyse the Density and Spread of Scotch Broom

Key words: Scotch Broom; spread rate; density; Logit model;

Scotch Broom is an invasive weed in many subalpine ecosystems. It often has substantial negative effects on ecosystem structure and functioning. Decisions on optimal management strategies require predicting the rates and patterns of Scotch Broom spread. This paper will explore the environmental and management factors which influence the density and rate of spread of Scotch Broom. Aerial maps showing Scotch Broom infestation in Barrington Tops National Park for 1989 and 1999 have been used to generate data for the analysis. Map reference points 1km apart along the boundary of the 1989 area of infestation were examined and 1999 areas and densities were measured. Environmental factors measured include vegetation, slope, altitude and the presence of private property. Areas of natural disaster, feral animal activity and the National Parks and Wildlife Service management activities were also included in the analysis. Our ability to quantitatively analyse the density and the spread rate is in part limited by the absence of parameter estimates for the soil type and rainfall. OLS and Logit models were used to analyse different forms of variables measuring the density and the spread rate of Scotch Broom.

Odom, Doreen, J.A. Sinden, Oscar Cacho and G.R. Griffith

Strategies for Controlling Weeds in Natural Ecosystems: A Dynamic Optimisation Approach

Key words: Scotch Broom; flora diversity; dynamic programming model; optimal control strategies;

Scotch Broom is a serious environmental weed in Barrington Tops National Park (BTNP) and the surrounding areas. Scotch Broom poses a significant threat of reducing ground flora diversity in invaded ecosystems and generating a false understorey, it also harbours feral pigs which perpetuate the disturbance cycle. To address the threat of invasion and problems caused by Scotch Broom in the 10 000 ha already invaded in the Park, it is vital to understand why this species is able to invade and persist in Australian ecosystems. Such understanding will be the key to developing effective management strategies, both to prevent invasions and to suppress dominance of Scotch Broom. Given the limited budget available for weed and pest control, as well as for general maintenance in BTNP, it is important to identify control strategies for Scotch Broom that are efficient and sustainable. A dynamic programming model developed for this purpose is developed in this paper. The model contains two state variables and five control variables. The state variables are the area occupied by Scotch Broom and the seed bank. The control variables include excluding tourists, manual pulling, herbicide application, feral pig control and biological control. Preliminary results are presented and further information requirements are discussed.

Pan, Jian-Wei

Sustainable Development of Animal Husbandry Economy in China's Pastoral Areas: Issues and Challenges

Demand for animal products has increased rapidly in China in the past two decades. This places an increasing strain on natural resources. To ensure a sustainable growth of animal products to meet the increasing demand, the sustainable utilisation of grassland resources and thus the development of a sustainable animal husbandry economy in China's pastoral areas is of great importance. This paper highlights issues that face the sustainable use of grassland resources and examines how the current macro economic, social, and market conditions may affect their sustainable use. This paper concludes by addressing policy measures for a sustainable use of grassland resources and

sustainable development of animal husbandry economy in China's pastoral areas.

Paul, Catherine J. Morrison and James M. MacDonald

Tracing the Effects of Agricultural Commodity Prices on Food Processing Costs

Key words: food processing, primary agricultural materials, virtual prices, embodied and disembodied technical change

Output levels and prices in the food processing sector are directly linked to the availability and prices of agricultural materials (M_A). However, this link appears to be weakening due to adaptations in input costs and food consumption patterns. This study assesses the roles of changes in food product demand, input prices, and technology on food processors' costs and output prices, with a focus on the demand of agricultural commodities. Our analysis of the 4-digit U.S. food processing industries for 1972-1992 is based on a cost-function framework, augmented by a profit maximization specification of output pricing, and a virtual price representation for agricultural materials and capital. We find falling virtual prices of M_A have provided a slight stimulus for increasing demand for primary food products, but that disembodied technical change and scale effects have been M_A -saving relative to intermediate food products.

Petersen, E.H. and R.W. Fraser

An assessment of the value of seasonal forecasting information for Western Australian farmers

Key words: seasonal forecasting information; seasonal uncertainty; whole-farm modelling; MUDAS

Of the number of seasonal forecasting systems that have been developed of late, none are of practical benefit to Western Australian farmers. This assessment of the value seasonal forecasting information aims to improve the methodology for climate forecasting research using the Merredin agricultural region of Western Australia as an illustration. Results suggest that seasonal forecasting information that enables a 30 per cent decrease in seasonal uncertainty increases annual profits by approximately five per cent. The accumulated annual benefit to farmers in the Merredin region (an area with 754 farm holdings over 35, 500 square metres of land) is approximately two million dollars. Hence, support is given for the development of seasonal forecasting techniques in Western Australia.

Petersen, Elizabeth, Steven Schilizzi and David Bennett

Alternative agricultures under the Kyoto Protocol: An assessment of policy options for greenhouse gas abatement on mixed cropping enterprises in the Great Southern of Western Australia

Key words: greenhouse gas abatement, farming systems, policy

Three policy options for greenhouse gas abatement in the predominantly grazing systems of southwestern Australia are analysed. A tax on total or methane only emissions will not allow any appreciable abatement without putting farmers out of business. Emission restrictions allow the farm to remain profitable at higher levels of abatement and are found to be the most effective policy option studied. However, any farm-level policy for greenhouse gas abatement would be politically unpopular in livestock dominant areas and, in the absence of swift technological innovation, would cause the current farming systems to fail and be replaced by alternative land-uses.

Pezzey, John C.V. (a)

Hartwick's rule versus optimal growth

Key words: Hartwick's rule, optimal growth

Occasional but significant and persistent confusions in the literature are clarified here about the connections, or the lack of them, between Hartwick's rule and optimality, the latter being defined as maximising present value using a constant discount rate. A development path which obeys Hartwick's rule is generally quite distinct from a optimal growth path for the same economy. Zero net investment generally is incompatible with, and so cannot be added as a constraint on, an optimal path. On an optimal path, net investment is generally zero only for a moment, and not when utility is constant, as illustrated by a counterexample.

Pezzey, John C.V. (b)

Five exact definitions of income in a hyperbolic economy

Key words: Hicksian income, definitions, hyperbolic discounting

Exact formulae are calculated for five definitions of "income" in a Cobb-Douglas economy with human-made capital, non-renewable resources, and hyperbolic utility discounting, which generalisese

Solow's 1974 constant consumption economy. The definitions are welfare-equivalent income, wealth-equivalent income, Sefton-Weale income, Net National Product and sustainable income. The formulae are all unequal, in the order predicted by theory. This illustrates how there are many ways of defining the potential for future consumption, so that uniquely defining "Hicksian income" is impossible. It also turns out that hyperbolic discounting allows optimal consumption to rise forever, even with constant technology.

Pezzey, John C. V. and N. Ross Lambie

Distributing the value of a country's tradeable carbon permits

Key words: carbon permits, distribution, political acceptability

We suggest general principles for initially distributing the total value of tradeable carbon permits. To achieve political acceptability, some free carbon permits should be given to fossil-fuel industries to compensate for net profit losses caused by carbon control. Because reducing total carbon use in itself creates monopoly profits, this compensation uses less than half of all permits. Provided most remaining permits are auctioned, with revenues recycled as lower conventional taxes, non-fossil-fuel industries need no compensation. Some free permits (or their cash equivalent) should be given to consumers as compensation for higher fuel prices, and to workers facing unemployment caused by carbon control.

Pezzey, John C.V. and John M. Anderies

Some further economics of Easter Island: adding subsistence and resource conservation

Key words: subsistence, conservation, Easter Island

We extend Brander-Taylor's model of development on Easter Island by adding a resource subsistence requirement to people's preferences, and a conservation incentive in the form of a revenue-neutral, ad valorem tax on resource consumption. Adding subsistence improves plausibility; makes overshoot and collapse of population more extreme, and the steady state less stable; and allows for the possibility that statue building and erection will suddenly stop, in line with the archaeological evidence. We find a tax rate path which almost completely prevents overshoot, and conjecture that the overall strength of this path must rise when the subsistence level rises.

Pluske, Jo and Bob Lindner

Canola – Where to from here?

Key words: canola, supply, demand

Canola may be marketed as grain, oil or meal. Supply and demand of each of the commodities is influenced by, physical factors associated with land and weather, substitute commodity competition, land-use competition, production indirectly associated with canola such as that within the livestock industry and the effects of technology and more specifically plant breeding. Furthermore, domestic agricultural and international trade policies, standard of living, and political stability of countries involved in the canola market together with exchange rates will also affect supply and demand for canola products. The implications of genetically modified canola also need to be understood along with each of the aforementioned factors and their relationship with each other to help predict the future for this crop. This paper provides such an overview and explains how Western Australia fits into the market.

Poonyth, Daneswar, Johan van Zyl and Nick Vink

Modelling the South African Agricultural Production Structure and Flexibility of Input Substitution

Key words: South African agriculture, production structure, elasticity of substitution

This paper evaluates the production structure of the South African Agricultural sector for the period 1970-1998, using a translog function. The results show that the production structure is best represented by production technology that is Hicks-neutral and homothetic. This information is useful in evaluating the results of previous research on the structure South African agricultural production, particularly relatively recent research on elasticities of substitution. Results obtained show that South African agriculture has become much more flexible and responsive with respect to the substitution of inputs following market liberalisation and the decrease of farm support in general.

Qureshi, M.E., Wegener, M.K., Bristow, K.L, Mallawaarachchi, T. and Charlesworth, P.B.

Economic evaluation of alternative irrigation practices for sugarcane production in the Burdekin Delta

Key words: groundwater, aquifer, irrigation technology, mathematical modelling

The Burdekin delta in north Queensland is a major irrigation area with more than 35,000 ha of irrigated sugarcane and other crops. This system is unique because it overlies shallow groundwater supplies and relies heavily on these supplies for irrigation water. The long-term 'health' of the groundwater systems is therefore critical to the economic and environmental well being of the whole region. Application of economic analyses that allow the impacts of allocating scarce groundwater resources to be assessed, and which allow the environmental and social opportunity costs and benefits of various irrigation management options to be evaluated may prove helpful in this process. A multi-period mathematical programming model is therefore being developed to estimate the responsiveness of water demand to price changes and to alternative water management and irrigation practices.

Qureshi, M.E., M.K. Wegener and F.M.Mason

The economics of sugar mill waste management in the Australian Sugar Industry: Mill mud case study

Key words: plant nutrients, heavy metals, optimal mill mud management

During raw sugar production, a mill produces a number of waste materials including bagasse, mill mud and boiler ash. The Australian sugar industry utilises these by-products as a source of energy (bagasse) and as a source of nutrients and soil ameliorants. Management of mill mud is important environmentally as there is one tonne produced for every 10 tonnes of sugar. A high moisture content combined with a relatively low nutrient content has restricted the distribution of mill mud/ash to within 10-15 km of the sugar mill. Heavy application rates have been used with little regard for soil fertility or crop nutrient requirements. Mill mud has been shown to contain higher levels of cadmium than total surface soil concentrations and restricted distribution within the mill area will aggravate the problem. This study analyses the economic feasibility of various mill mud application rates at different distances from the mill in the Mackay region of central Queensland.

Rausser, Gordon, Leo K. Simon, And Holly Ameden

Biotechnology R&D in Developing Countries: Negotiating Public-Private Research Partnerships

Key Words: Biotechnology; R&D; private-public research partnerships; bargaining

In the area of science and technology, there is a wide gap in knowledge between rich and poor countries and this gap is growing. In the area of agricultural biotechnology, a second gap, between private life-sciences companies and public research institutions, has emerged in recent years. As a result there exists a rapidly widening gap between the cutting edge research and development (R&D) in the developed world and the publicly sponsored research in the developing world. One obvious strategy for narrowing this compound gap is to form private-public research alliances for biotechnology research based in the developing world. To navigate through all the obstacles toward successful private-public collaborations, public research institutions in the developing world will need to adopt creative new approaches to the process of negotiating with their potential partners. These new approaches must focus on leveraging the complementarities and potential synergies between their knowledge assets and those of the private sector, while at the same time setting in place institutional arrangements geared toward managing the risks, both objective and perceived, that are of greatest concern to their constituencies. In this paper, we construct a model of the negotiation process between a public research institution and a private life-sciences company forming a research alliance. The parameters of our model represent the ambient negotiating environment. Numerical comparative statics techniques can be applied to analyze the model from the perspective of the public partner. These techniques enable us to evaluate the relative effectiveness of alternative positioning strategies for the public institution over a wide range of ambient negotiating environments. In particular, the experiments enable us to identify and evaluate potential complementarities between the institution's contributing assets and those of potential private partners, to seek out potential gains-to-trade, and, eventually, to select the most promising research partner. Once this partner has been selected, the techniques can provide insights about the relative merits of alternative ways to structure the bargaining environment and to conduct negotiations.

Read, Mike

Dryland salinity – do we have the knowledge or capacity to manage the problem?

Drawing mainly on the work of the National Land and Water Resources Audit and recent studies by ABARE, this paper reviews the current state of knowledge about the physical extent of dryland salinity in Australia and about the benefits and costs associated with various options for managing the problem. Preliminary conclusions suggest that recent research has focussed too much on the role of catchment-scale treatments, which have generally been shown to be uneconomic. The potential benefits and costs of local-scale treatments are considered. The relative size of on-farm and external benefits and costs is stressed. It is concluded that externalities are often relatively minor and that the emphasis should be placed more on management measures aimed at achieving local benefits.

Reddy, M., Lal, P. and Lim-Applegate, H.

Fiji sugar industry and the land tenure dilemma: issues of efficiency, equity and national development.

Key words: land tenure, Fiji sugarcane industry, efficiency and equity

The sugar industry, the main export earner in Fiji, directly contributes about 22 % of the national GDP and supports over 25% of the country's active labor force. Over 80% of the cane land is leased, mainly by Indo-Fijians from the indigenous Fijians through the communal land management organization, the Native Land Trust Board. These legislated 30 year leases began expiring in 1997 and have reverted back to the landowners who have limited or no experience in any commercial farming, let alone sugar cane farming. The post coup interim government has proposed an alternative (pro-Fijian ?) legislation to guide land tenure arrangements in Fiji. This paper will explore the land tenure dilemmas facing Fiji today. It will specifically assess the economic implications of the two legislations and examine other options available in Fiji to encourage productive, efficient and sustainable use of land for equitable development

Rolfe, John

Assessing demands for irrigation water in North Queensland

Irrigation underpins approximately one-third of the value of Queensland's agricultural production. There are calls for further development of water infrastructure in northern Queensland to enhance the production of sugar cane, horticulture, aquaculture and other crops. One of the steps in assessing potential new developments is to establish which groups have demands for additional water, and how sensitive they are to price. Surveys are one mechanism that can be used to gauge this information. Various surveys to assess water demands have been carried out in the Mackay, Burdekin and Atherton Tablelands regions and the results are reported in this paper.

Rolfe, John and Veronika Zeil

Methane emissions from cattle production – Issues in meeting the Kyoto targets.

Key words: greenhouse gas, beef production, mitigation

Methane is a greenhouse gas that is emitted mainly by livestock, and accounts for about 14% of national greenhouse gas emissions. If Australia is to meet the Kyoto targets, then greater attention is likely to be focused on ways that methane emissions can be reduced. The three main options to reduce methane emissions are to reduce livestock numbers (particularly in rangelands areas), reduce emissions per kilogram of beef produced (by improving feed efficiency and other factors), or to manipulate microbial activity in the rumen by biological, chemical or immunological control agents. These broad options are discussed in relation to the beef industry in Central Queensland.

Ronan, Glenn, Jack Langberg and Michael Moore

Evaluating the Export Growth Strategy of the Australian Pork Industry

Key words: Pig and pigmeat industries, imports, exports, Australia

Economic theory would suggest that Australia's small, pig and pigmeat industries would have little prospect of developing pork export markets in competition against world leading export countries in North America and Europe. The federal government challenged the industry to do just that when it began opening the domestic pigmeat market to imports in 1990. Faced with

rising imports from the mid-nineties, an Export Market Group was formed by industry as an import-survival strategy. The 1998 pig industry crisis converted industry and government from protagonists to cooperators in a concerted export growth strategy. The $24 million National Pork Industry Development Program included funding for an alliance of exporter's; the Confederation of Australian Pork Exporters (CAPE). Formed in April, 1999, CAPE defined a marketing target to achieve 20 percent of farmed pigmeat production as exports by 2002. The paper outlines the transition of Australia's pig and pigmeat industries from closed domestic to export orientation during the past decade. It evaluates the progress of the industries towards their short term marketing target and their prospects in the longer term of maintaining domestic viability and developing and sustaining a viable export sector in the face of world competition.

Schamel, Günter and Kym Anderson

Wine Quality and Regional Reputation: Hedonic Price Equations for Australia and New Zealand

Key words: wine quality, regional reputation, hedonic pricing.

We estimate hedonic price functions for premium wine from Australia and New Zealand, differentiating implicit prices for sensory quality ratings, wine varieties, and regional as well as brand reputation over the vintages 1992 to 1998. For Australia, regional indicators become increasingly significant through time, indicating an intensifying regional quality differentiation. Some regions become increasingly preferred as well (e.g. Adelaide Hills, Tasmania). Also, price premiums based on brand reputation are significant. Regional quality differentiation is considerably less significant in New Zealand than in Australia, which raises the question as to why and whether there is scope for more regional promotion there. In both countries, price premiums for James Halliday's sensory quality ratings are highly significant and remain fairly constant over time.

Schilizzi, Steven

Accounting systems and environmental decision making: what costs, what benefits?

Key words: environmental accounting, corporate governance, shareholder value, stakeholder analysis

The environmental accounting literature covers both public and private, or corporate, fields. The needs of private firms differ from public organisations in that environmental accounting systems must pay for themselves. Stakeholder analysis and the so-called triple bottom line forget that shareholders (and regulators) must be satisfied. However, unsatisfied stakeholders can impact on the firm's financial prospects and on shareholder value. This leads to strategic accounting, which endogenises future environmental costs, and relates to corporate goodwill and social capital. Rethinking private environmental accounting shows how it can lead to more efficient corporate governance, and what role government can play.

Scott, Fiona and Bob Farquharson

Whole-farm models for northern NSW grain production systems

Key words: whole-farm, technology evaluations, resource impacts

Technology and resource issues affect the decision making of northern NSW grain producers. Simulation of outcomes under alternative scenarios is useful in helping on-farm decision-making, in guiding research and development and in evaluating alternative government policies. Interactions within the farming system imply that evaluation of alternatives at the whole-farm level can be valuable. In this paper we detail our progress and experiences in developing whole-farm models for northwestern NSW crop-based farms. Some models and applications are presented. We discuss some implications for considering longer-term resource-based questions in undertaking this type of work.

Seyoum, Emayenesh and Ellen Goddard

Evaluation of Export Credit Programs on Trade in Dairy Products:-Implications for Australian Dairy Industry

Key words: export credit guarantee, price discrimination, dairy product.

The international dairy market is changing both as a result of the Uruguay Round Agreement disciplines and deregulatory developments in the world economy. Countries and large regional players are looking for nontraditional methods to continue furthering their domestic agendas. One policy to face increasing attention will be export credit guarantee programs which can be shown to be a mechanism that facilitates price discrimination within targeted importing countries. This paper presents a synthetic analysis of the implication of the potential use of export

credit guarantees on Australian exports of dairy products as well as a comparison of those effects to that generated with a similar investment in export subsidies.

Singh, Rajinder P., John Mullen, Khaled Faour and Robert Williams

Economic analysis of nitrogen use in rice in Australia

Key words: nitrogen, yield, risk

Nitrogen is a crucial input for the efficient production of rice but there is no pre-sowing test to estimate N requirements and farmers use cropping history to make this decision. Later in the season further nitrogen can be applied on the basis of plant tissue analysis but yield potential has often been established by this time. A further source of yield risk is temperature at flowering. At high rates of nitrogen there is a potential for yield losses at low temperatures. Our objective is to present this problem in a decision tree framework allowing information from soil and tissue tests to be used in a Bayesian framework to inform the probabilities farmers attach to various yield outcomes and hence nitrogen use decisions.

Smith, H. and P. Pagan

Can Cover Cover Costs: Approaches to the Economic Assessment of Native Vegetation Management

Key words: Native Vegetation Management

Native vegetation management has become an issue of great community concern in recent times. Various initiatives have been established to address regional and state wide land degradation issues thus placing increasing pressure on land managers to develop more sustainable native vegetation management solutions. A great deal of literature has been produced identifying various aspects of the economics of native vegetation management. In spite of this however, it appears that land managers are still not making socially optimal decisions in regards to the management of native vegetation. This paper identifies the economic issues behind native vegetation management, and discusses some deficiencies with existing approaches in providing land managers with better information on which to base decisions. The paper then proposes a general approach, which attempts to overcome many of these problems

Stevenson, Alan and Milton Boyd

Lead Lag Relationships Between Resource Prices and Corresponding Resource Company Share Prices

Key words: resource prices, price transmission, lead lag relationships, and Granger Causality

The purpose of this study is to examine the lead lag relationships between resource prices and corresponding resource company share prices. It is hypothesized that as a resource price changes, the share price should also change for a corresponding company producing the resource. However, price changes and price transmission between the two markets may have lag periods. Lags may occur due to factors such as transaction costs, taxes, information arriving in large doses, market imperfections, and market trends. Granger causality tests are used to determine lead lag relationships and direction of causality. The main industries examined are grains, oil, lumber, gold, silver, and copper. Approximately 50 company share prices are included.

Stewart, Micki and James E. Wilen

A Two Sector Analysis of the Galápagos Marine Reserve

Keywords: Marine Reserves, Fisheries, Ecotourism

The recent establishment of the Galápagos Marine Reserve (GMR) presents a unique opportunity to analyze the economic implications of using zonification as a tool to manage conflicting claims to a fragile and limited resource. Recognizing that the long-term success of the GMR depends on the cooperation of all of the stakeholders involved, a remarkable feature of the new legislation is that further policy development depends upon analysis of the socio-economic and environmental impacts that the new management regime has on both the users and the ecosystems of the GMR. We consider some of the economic impacts to the residents of Galápagos, and in particular to the fisheries sector, resulting from the use of "no take" zones as a management tool. We develop a simple two-sector fixed labor model to illustrate how the establishment of "no take" zones, which impact the fishing sector, will also affect the tourism sector through both the labor market and biotic mechanisms. Although we find that the establishment of marine refugia passes a rough cost-benefit analysis, we discuss the importance of considering the intertemporal nature of the impacts resulting from the closure of

fishing grounds in the GMR when analyzing the economic impacts to the various sectors.

Stoneham, Gary, Mark Eigenraam, Charlotte Duke and Loris Strappazzon

Permits, Auctions and Output

Key words: environment, permits, auctions

The pollution (or waste) of point-source emitters is usually the by-product of their production of some environmentally-unfriendly good. When an environmental agency can monitor pollution from point-source emitters, then emissions permits—ie, a 'cap and trade' system—may provide an efficient way to control environmental damage. In agriculture, landholders can provide public goods through, *inter alia*, habitat protection and buffer zones. In these circumstances, then land-use change auctions may provide a low-cost policy mechanism: an environmental agency can pay landholders to undertake the provision of public goods. The agency can administer contracts for public good provision by using an auction system. When the agency can purchase waste-mitigation services from landholders, then these services can potentially be incorporated into an emissions permit market. In other words, landholders may be able to sell mitigation units to polluting firms. In this paper, we develop a formal model that combines point-source emitters of waste, with landholders that can provide waste-mitigation activities, in one 'environment economy'. We use the model to demonstrate the benefits of such a system. In the model we explicitly consider the effect of the scheme on output of the environmentally-unfriendly good.

Strappazzon, Loris

Well-Being Indicators and Conceptual Models

Key words: indicators, philosophy, well-being

The literature on indicators of well-being is vast. This is, to a large extent, because it has been written by people from many different disciplinary backgrounds. Economists have often taken part in discussions regarding appropriate indicators.

In this paper I aim to highlight the implicit assumptions that lie behind the different indicators of well-being, paying particular attention to indicators that economists advocate.

I show that indicators promoted by different groups reflect particular philosophical underpinnings, and that there is no 'correct' set of universal indicators. This highlights the need for explicit and transparent judgements, rather than appeals to a 'value-free' set of indicators—which is an unattainable ideal.

Suhariyanto, Kecuk and Colin Thirtle

Agricultural Productivity in Asia: Convergence or Divergence?

This paper measures agricultural productivity growth rates, for 18 Asian countries, between 1965-1996, focusing on the issue of convergence. Total factor productivity is measured using the Malmquist index with respect to the *sequential* frontier. Both cross-section and time series approaches show that there is no evidence of convergence in agricultural productivity for these countries. There is no evidence indicating that the gap in productivity differences among countries is narrowing and there is no sign that productivity differences will vanish in the long run. Rather, the results seem to suggest that the leading countries remain firmly in the lead over the period investigated.

Tanner, Carolyn

Quarantine Reform and Market Access

Key Words:

Despite major reforms to the Australian quarantine system in recent years, market access and quarantine decisions continue to be controversial. The aim in this paper is to examine the impact of the quarantine reforms and the implementation of the SPS Agreement on quarantine decision making in Australia. Changes in market access for Australian exporters are also investigated.

Taylor, Philip

The Importance of Industry Structure: Lessons from the Wine Industry

Key words**:** industry structure, wine, transaction costs, government intervention.

Transaction costs are a large proportion of the cost structure along the value chains of most industries, especially the food and beverage industries. Competition forces industries to structure their value chains to minimise transaction costs but, in agriculture, this process is commonly impeded by government intervention. In Australia, this has resulted in severe distortions to the structure of most agricultural industries. The wine industry, particularly in South Australia,

has avoided or overcome these distortions more effectively than most and its current international competitiveness is the result. The paper discusses how it has done so and the implications for other food and beverage industries.

Trewin, Ray

The Economics of Regulated Changes to the Australian Egg Industry

Key words: egg production systems; animal welfare; non-market values

The Australian egg industry is facing adjustment pressures including from animal welfare developments. Production and consumption of free-range eggs are rising in response. However, considerations have been given to banning the dominant conventional cage production as in Switzerland. Consideration has also been given to compulsory labelling eggs by their form of production. A focus of the research is to develop possible future scenarios and to value any associated animal welfare benefits against the cost of changes. The extent of market failures such as negative externalities from the consumption of conventional cage eggs will be an important aspect of the analysis.

Tuan, Francis C.

Structural Change in China's Livestock Production and Its Trade Implications

Key words:

Livestock production in China has grown significantly since the mid-1980s. Although China's National Bureau of Statistics recently revised livestock statistics downward based on the results of China's first agricultural census conducted in 1997, it is no doubt that supply and demand for livestock products have surged over the past two decades, driven by the country's rapid economic development. In China, meat and eggs are still produced predominantly by farmers raising a few pigs or chickens as a sideline industry, nevertheless, commercial operations and households specializing in livestock production provide an increasing share of the total output in recent years. The changing structure of livestock production, along with favorable government policies, also affected the development of China's feed manufacturing industry. China's feed industry is now the world's second largest, with an output of 66 million tons in 1998, and growing at an average annual rate of 15 percent since 1990. Livestock producers are switching from traditional feeding practices to mixed feed or compound feed as commercial chicken and hog farms gain larger market shares, particularly around large cities. Currently, commercial operations use only compound and mixed feed, and specialized households also rely far less on homegrown grain and farm by-products. Recent studies revealed that both of these types of operations are more responsive to grain prices than traditional "backyard" operations. This paper will review in detail the rapid development of China's livestock production, consumption, and trade, as well as the growth of its related feed manufacturing industry, over the past twenty years. The study will also discuss the related policies that were specifically formulated by the central government for facilitating those developments. In addition, to illustrate the comparative advantages or disadvantages of various livestock products, feed grains, and oilseed crops in terms of China's domestic and international trade, this paper will present a set of estimated indices. These estimates include domestic resource costs (DRC), net social profitability (NSP), effective rate of protection (ERP), and regional comparative advantage indices (RCAI). The estimates should be useful because China is ready to accede to the World Trade Organization (WTO). Finally, this study will summarize the trade implications of the structural change in China's livestock production. It will explain how production and trade changes imply a derived demand for feed grains, oil meal, other oilseeds, and feed additives, not only from domestic sources but also from the international markets. In conclusion, the paper will suggest what other policy reforms are needed by China's government to sustain the rapid development of the country's livestock production, with emphasis on the potential impact of WTO accession on future growth of the sector.

Tyers, Rod and Yongzheng Yang

Global Effects of a US Technology and Investment Shock: the Role of Capital-Skill Complementarity

A global general equilibrium framework is employed to examine the implications of capital-skill complementarity for the analysis of recent technical change and investment shocks. A prominent force in recent technical change can be characterised as capital augmentation, associated with rising "equipment content" of the capital stock and this change appears to have been the more rapid in the US. A short-run analysis of investment and capital augmentation shocks in the US alone shows that these shocks raise the US skill premium and reduce US real returns to land by more the greater is the capital-skill complementarity. The effects on other regions

depend on associated real exchange rate and terms of trade changes. In Canada and Australasia land holders gain from these shocks and by more the greater is capital-skill complementarity. Labour market outcomes outside the US appear, however, to depend most on region-specific macroeconomic and labour market policy.

Ullah, Mujib and Oscar Cacho

Property Rights and Sustainable Land-use on a Salinity-affected Catchment

Key words: dryland salinity, dynamic modelling, sustainable land-use, common property

Dryland salinisation is a non-point and intertemporal stock externality which requires a dynamic modelling approach to study its long-term management. In this paper a simple dynamic optimisation model is developed and applied to find land-use strategies that maximise benefits from the viewpoints of both individual farmers and the catchment as a whole. Privately optimal land-use results in an ever-increasing trend in salinity and a declining trend in productivity for the discharge zone of the catchment. Considerable welfare losses to society occur under private management when the recharge and discharge zones are owned by different individuals. These welfare losses are estimated by comparing the value of the stream of benefits obtained by the catchment under private optimisation, with those obtained when the catchment is management under a common property regime. Difficulties in establishing such a system are discussed, in particular the problem of establishing enforceable common property rights over the groundwater table.

Ullerich, Stanton G

Structural Changes in Midwestern U.S. Farming: The New Zealand Experience Revisited?

Key words: agricultural structure, farm policy

This paper examines both parallels and differences in farm structure between Midwestern U.S. agriculture and New Zealand production under changing (ed) farm policy regimes. Land tenure and land values, nominal and indexed costs and prices, changing technology, altered public sector assistance, and supply responses are analyzed in a stylized aggregation useful to policy makers, fit for prediction, and helpful for those wanting to assess output and structural changes in production agriculture.

van Bueren M., and J. Bennett (a)

Towards the development of a transferable set of value estimates for environmental attributes

Key words: choice modelling, benefit transfer, non-market valuation

Estimates of environmental values are frequently required as inputs to cost-benefit analyses when evaluating alternative resource use options. Owing to the high cost of conducting empirical work when non-market environmental values are involved, it is common practice to transfer benefit estimates from an existing study to the site of interest. However, this practice is subject to a host of potential errors and can lead to poor policy recommendations. This paper reports the results of a national study that was designed to address the issue of benefit transfer. A Choice Modelling technique was used to estimate values for a generic set of environmental attributes at a national level. This approach is amenable to benefit transfer because, unlike Contingent Valuation, the attribute values are estimated independently of any specific resource-use policy. The validity of transferring the national estimates to regional areas is tested, and inferences are made about the impact that differing frames of reference have on value estimates.

van Bueren M., and J. Bennett (b)

Testing alternative questionnaire formats for communicating trade-offs in environmental Choice Modelling

Key words: non-market valuation, choice modelling.

Choice Modelling is a stated preference technique for valuing non-market goods. In the case of environmental valuation, respondents are presented with an array of alternative resource-use options, which are described by a bundle of attributes whose levels vary across the options. Respondents are asked to select their most preferred option and, in doing so, are required to make trade-offs between the attributes. While this technique offers a number of advantages over Contingent Valuation, it places a much greater cognitive burden on respondents. In mail-out surveys, the added complexity can induce low response rates and self-selection of respondents. This study examines whether the choice task can be simplified by using visual stimuli in the choice set to represent individual attributes and their levels. A split-sample experiment is employed to test for differences between this graphical format and a conventional, "numbers-only" format.

van Rooyen, Inus, Johann Kirsten, Johan van Rooyen, and Ray Collins

Competitiveness of the South African and Australian Flower Industries

Key words: revealed comparative advantage; competitive advantages; flower industry

Competitiveness is defined to include both comparative and competitive advantage. Three different methodologies are applied in the analysis of the flower industries of South Africa and Australia: "Determinants of competitive advantage" methodology of Michael Porter (1990) describes the factors influencing competitive advantage; "Revealed comparative advantage" states the relative importance of flower trade in each country; and the "Policy Analyses Matrix" calculates the comparative advantage of specific flower groups. Each method highlights different viewpoints and conclusions on international competitiveness. Based on the results of the three methodologies it is concluded that the South African flower industry is more competitive but also has a greater comparative advantage in the production of flowers than the Australian flower industry.

van Zyl, Johan, Nick Vink, Barend Erasmus and Albert van Jaarsveld

Modelling the Effects of Climate Change on Agriculture in South Africa: The Case of The Western Cape

Key words: climate change, South African agriculture, mathematical programming

Two different methodologies are linked to determine the effects of climate change on the Western Cape farm sector in South Africa. First, it uses a general circulation model to model climate change. Second, a sectoral mathematical programming model is used to determine these effects on key variables of the farm economy. Results indicate that less water will be available to agriculture. This will have a negative overall impact, with both producer and consumer welfare decreasing. Total employment in the farm sector will also decrease as producers switch to extensive farming. The total decline in welfare falls disproportionately on the poor.

Whitley, John

Market Structure Changes in Agriculture: Assessing the Costs and Benefits

This paper surveys recent changes in agricultural market structure that have been the focus of the contentious debates on globalization and industrialization. The discussion is placed in the framework of the existing industrial organization literature in an attempt to add structure and tractability to the analysis. The tradeoff between (physical) efficiency and market power gains from concentration are analysed, empirical techniques for measuring this tradeoff are briefly reviewed, product differentiation and branding are discussed, and several models of vertical integration and research and development are reviewed. The aim of the paper is to solidify the discussion of structural change in agriculture and provide a concrete research program for assessing the impact on consumers, producers, and economic efficiency.

Whitten, S.

If you build them, will they pay? – Institutions for private sector nature conservation

Key words: institutions, incentives, non-government nature conservation

Nature conservation within Australia is dominated by the government sector. The degree of dominance in Australia is not necessarily exhibited in other countries, in particular the United States. The degree of public sector involvement in nature conservation is suggested to be, in part, a product of the institutional framework. The range and type of activities undertaken by the private sector is posited as a product of institutional framework along with the characteristics of the goods and services produced shapes. The range of constraints faced by the private sector within Australia differs from those faced in other nations. In this paper some of these differences are identified. The implications are examined by reference to overseas institutions and the resulting incentives, in particular those in the United States and the United Kingdom. A discussion of the potential implications of alternative policy strategies for private sector involvement in nature conservation concludes the paper.

Whitten, S. and J. Bennett (a)

A Travel Cost Study of Duck Hunting in the Upper South East of South Australia

Key words: travel cost method, wetlands, private and social benefits

Wetland protection in the Upper South East (USE) of South Australia yields a range of private and social benefits. The profit motivation for private wetland owners to supply private benefits is clear whilst the provision of purely social benefits by private suppliers has no similar incentive. One potential for the provision of social benefits from private lands arises when a private benefit is jointly supplied with a social benefit. Such is the case of nature-based recreation activities such as duck hunting. In this paper, the results of a study investigating the extent of the benefits enjoyed by duck hunters in the USE are reported. The travel cost method was employed in a survey of those participating in a weekend duck hunt. The extent of the private recreation benefits so estimated is assessed in terms of their potential to stimulate the provision of wetlands for both private and social benefits.

Whitten, S. and J. Bennett (b)

Valuing Alternative Wetland Management Strategies using Choice Modelling

Key words: choice modelling, natural resource management, wetlands

Decisions regarding the use of natural resources frequently involve multiple options. Assessing each of the available options can be a time consuming and costly process where non-market environmental values relating to the options are to be estimated. Choice Modelling (CM) offers the potential to provide non-market value estimates for an array of alternative natural resource management options from a single data collection exercise. This cost-saving feature arises because CM enables the estimation of values for outcomes as a function of the attributes that characterise the outcomes as well as the socio-demographic features of those whose values are being estimated. The capacity of the technique is demonstrated in this paper through case study applications involving wetland management in the Upper South east of South Australia and the Murrumbidgee Floodplain in NSW.

Wimalasuriya, Rukman and Mark Eigenraam

An Agro-economic Model that Optimises Crop-Pasture-Fallow Rotations from all Theoretical Possibilities

Key Words: crop rotations; linear programming; unrestricted; long fallow; pasture; sheep

Crop-pasture rotations are more complex systems to model compared to continuous cropping rotations, due to the existence of interactions between crops, pasture and livestock. Inclusion of a "long fallow" phase that interacts with both crops and livestock further increases this complexity. This paper explains a linear programming model developed by the Victorian Department of Natural Resources and Environment. The model represents the mixed grain/sheep farming system of the Victorian Mallee region where crops are rotated with annual legume pasture and "long fallow". Model runs have highlighted important issues in relation to the objective of profit maximisation and the trade-off against risk management by farmers.

Wittwer, Glyn, Nick Berger and Kym Anderson

Modelling the World Wine Market to 2005: Impacts of Structural and Policy Changes

Key words: wine, grapes, global wine modelling

This paper addresses the question: What will the global wine market look like by 2005, when premium wine from Australian and other New World plantings will be ready to market? It does so using a newly developed World Multisectoral Wine Model which distinguishes premium from non-premium grapes and wine. After describing the model, we present results of projecting it from 1999 to 2005 to estimate the impact of known winegrape plantings of the late 1990s on producer and consumer prices in different regions, without and then with additional effective market promotion by Australia. Using the latter 2005 scenario as the base, we then examine in turn the effects on the global market of a strengthening of the US dollar, of a spread of Pierce's Disease in California, and of a European trade policy response to the growth in premium wine exports from the New World. Production, trade and welfare results are provided for ten regions spanning the world.

XinTinghui, Malcolm Wegener, Michael O'Shea, Ma Deling

World distribution and trade in neem products with reference to establishing a potential industry in China

Key words: neem; azadirachtin; pesticides

Neem is regarded as a promising tree species which can be utilized in various ways to benefit agricultural communities throughout the world. Scientists and entrepreneurs are paying considerable attention to its potential value as a source of biopesticides through extracts from neem seeds, bark, and wood. Azadiraction the most important active compound from neem seeds and other plant parts has natural insecticidal properties and may be a potential substitute for synthetic pesticides which are widely used in crop production in China. However the distribution of neem trees among major producing countries, the trade in neem products on the world market, and potential supplies of azadiractin for China are not widely known, a topic which will be addressed in this paper.

Yang, Yongzheng and Yiping Huang

Trade Liberalisation and Income Distribution in China: a general equilibrium analysis

Key words:

This paper employs a multi-household general equilibrium model to examine the impact of trade liberalisation on income distribution in China. Several key characteristics of the Chinese economy are incorporated in the model. These include the large shares of non-agricultural activities in rural household incomes, the segregation of rural industries from urban industries, and the limited mobility of capital and labour between the rural and urban sectors. Simulation results show that for the wealthiest rural households in the coastal region, the removal of agricultural tariffs would actually improve their economic welfare, along that of urban households, while the poorer rural households would be worse off. With continuous rapid growth of rural incomes from non-agricultural activities, more households will benefit from agricultural trade liberalisation in the future. If tariffs on all commodities were removed, every group of households would benefit. In addition, rural-urban income disparities would be reduced and income distribution among rural households would become more equitable, although urban inequality may increase slightly.

Yao, Shunli and Kym Anderson

GMOs and the World Trade: Implications for China as a WTO Member

Key words:

The growing adoption of genetic engineering technology in agriculture has raised concerns over the safety of genetically modified organisms (GMOs). These concerns also overshadow the prospects for liberalization of world trade in farm products, since the recent Cartagena Protocol on Bio-safety may well be inconsistent with WTO obligations of signatories. The differences in attitudes toward GMOs among major WTO members may well become a source of trade disputes in the WTO. This paper tries to shed light on the implications of the GMO controversy for China, prospectively a major producer and user of GM farm products and a pending WTO member. The paper has three parts. Part One backgrounds the current status of GMO adoption, the Bio-safety Protocol and its relationship with relevant WTO agreements. Part Two highlights GM-related developments in China and the patterns of trade in primary and processed farm products that are most likely to be genetically engineered in the foreseeable future. This part presents hypotheses as to the potential economic effects of China adopting GMOs, and of alternative government and consumer responses in the EU and in high-income Asia to GMOs. Then in Part Three those hypotheses are explored using the GTAP model of the global economy to produce empirical results. Starting from a base case which assumes China has become a member of WTO, several simulations are conducted to address such questions as the following: What is the cost for China if it does not adopt GMOs while other countries do? The US is the most liberal GMO adopter, the EU is the most vocal GMO opponent; and in between the rich Asian countries where the GMOs awareness is on rise. Which is likely to matter more for China: EU or rich Asian countries' dislike of GMOs-inclusive crops and agricultural products? This requires a scenario involving consumer preference change. Alternatively, either or both regions could encourage their governments to placea ban on imports of GMOs-inclusive crops and agricultural products, which requires modeling a scenario involving a government response. Given that China's WTO entry and MFA phase-out will result in sectoral adjustment, including an expansion of its textile and clothing exports, to what extent will the productivity and welfare improvement induced by the adoption of GM cotton be offset by an adverse change in the international terms of trade for China?

Zhao, Fengqin and Thomas I. Wahl

Trade Liberalization under WTO: Implications for US-China Grain Trade

Key words: China, WTO, TRQs

In November, 1999, China and the US signed a bilateral WTO agreement to eliminate trade barriers on agricultural products. This agreement is a fundamental shift in Chinese agricultural trade policy and is likely to significantly affect world grain markets. Under WTO rules, changes in relative tariffs, quotas, tariff rate quotas, and trading systems may have differential effects on Chinese and world grain markets. To examine the quantitative effects on China and US grain markets after China's accession, a multi-region, multi-commodity partial equilibrium model is estimated. The effects of alternative trade liberalization scenarios are examined.

Zhao, Xueyan, John Mullen and Garry Griffith

Some Practical Issues in Economic Surplus Measurement in Multi-Market Models

Key Words: equilibrium displacement model, economic surplus, R&D evaluation

In spite of controversy around it over decades, economic surplus has continued to be used in empirical cost-benefit analyses as a measure of welfare to producers and consumers. In this paper, the issue of measuring changes in economic surplus resulting from exogenous supply or demand shifts in multi-market models is examined. A two-input and two-output equilibrium displacement model is used to investigate the measures of economic surplus changes to consumers and producers. It was pointed out that when markets are related through both demand and supply, significant errors are possible when using conventional economic surplus areas incorrectly as is evident in some applications in the literature.

Zhou, Zhang-Yue and Wei-Ming Tian

China's Joining the WTO: Opportunities and Challenges for the Agribusiness Sector

Key words:

China first applied to join the GATT (now the WTO) in July 1986. After almost 15 years of negotiations, China may soon get accepted to the WTO. China's joining the WTO will undoubtedly bring opportunities and challenges to the agribusiness sector of both China and overseas countries. To a large extent, opportunities for China's agribusiness sector are likely to be challenges for the agribusiness sector of foreign countries; and for the same reason, challenges for China are likely to be opportunities for overseas countries. In this paper, after highlighting China's "long journey" to the WTO, we examine the likely opportunities and challenges facing the agribusiness sectors of China and overseas countries, with particular reference to Australia. We will also attempt to identify possible areas of cooperation between China and Australia's agribusiness sectors.

Zhou, Zhang-Yue, Wei-Ming Tian, Xi-An Liu and Guang-Hua Wan

An Issue of Debate: China's Feedgrain Demand and Supply

Key words:

In the past decade or so, China's feedgrain demand and supply has drawn increased attention from both academia and government departments within and outside China. In this stock-taking literature survey, we examine when and how China's feedgrain demand and supply became a topical issue and why it is important. We will highlight, from earlier studies, key findings regarding how much feedgrain China will demand and whether China can supply the amount demanded. We will also elaborate on whether the Chinese are likely to eat more meats or foodgrains and the possible impacts of China's feedgrain market development on the world feedgrain market. The paper concludes by pointing out the areas where further research efforts are needed in regard to China's feedgrain demand and supply.

Conference Participants

Participant	*Affiliation*	*Telephone*	*E-mail*
F. Ahmadi-Esfahani	The University of Sydney	02 9351 3559	f.ahmadi@agec.usyd.edu.au
Joni Aji	Muresk Institute of Agriculture	08 9690 1571	ajij@muresk.curtin.edu.au
Chris Alaouze	University of NSW	02 9385 3501	c.alaouze@unsw.edu.au
Julian Alston	University of California	530 752 3283	julian@primal.ucdavis.edu
Igusti Ambarawati	University of New England	02 6773 2542	iambaraw@metz.une.edu.au
Fiona Anderson		07 3378 2990	nim_42@yahoo.com.au
Jock Anderson	World Bank	1 202 470 0437	janderson@worldbank.org
Kym Anderson	University of Adelaide	08 8303 4712	kym.anderson@adelaide.edu.au
Walter Armbruster	Farm Foundation	630 571 9393	walt@farmfoundation.org
Ian Atkinson	CRC Molecular Plant Breeding	08 8303 6539	ian.atkinson@adelaide.edu.au
Nicole Ballenger	USDA/ERS/OA	1 202 694 5000	nicole@ers.usda.gov
Peter Barry	University of Illinois	217 333 1827	p-barry@uivc.edu
Steve Beare	ABARE	02 6272 2040	sbeare@abare.gov.au
John Beghin	Iowa State University	515 294 5811	beghin@iastate.edu
Brian Bell	Nimmo-Bell Company	64 4 472 4629	brian@nimmo-bell.co.nz
Jeff Bennett	Australian National University	02 6249 0154	jeff.bennett@anu.edu.au
Ian Black	SARDI	08 8303 9608	black.ian@saugov.sa.gov.au
Janelle Black	University of Western Australia	08 9380 2539	janelle.black@wrc.wa.gov.au
Milton Boyd	University of Manitoba	204 474 6031	boyd@ms.umanitoba.ca
Christopher Branson	AFFA	02 6272 5634	christopher.branson@affa.gov.au
Donna Brennan	ACIAR	02 6217 0531	brennan@aciar.gov.au
John Brennan	NSW Agriculture	02 6938 1851	john.brennan@agric.nsw.gov.au
Lisa Brennan	CSIRO Sustainable	07 3214 2375	lisa.brennan@tag.csiro.au
Paul Brennan	GRDC	642 6687 5288	
Melissa Bright	PIRSA Rural Solutions	08 8303 9614	bright.melissa@saugov.sa.gov.au
Michael Burton	University of WA	08 9380 2531	mpburton@agric.uwa.edu.au
L.J. Butler	University of California	530 752 3681	ljbutler@ucdavis.edu
Selim Cagatay	Lincoln University	64 3 325 6080	selim@ihug.co.nz
Renae Carolin	DNRE, Victoria	03 9637 8583	renae.carolin@nre.vic.gov.au
Ray Challen	University of WA	08 9380 3410	rchallen@cyllene.uwa.edu.au
Judith Chambers	Monsanto Company	202 383 2877	judy.a.chambers@monsanto.com
Glenn Chapman	SA Housing Trust	08 8207 0430	chapman.glenn@saugov.sa.gov.au
Lisa Chapman	ABARE	02 6272 2091	lchapman@abare.gov.au
Fred Chudleigh	Dept of Primary Industries	07 49 837 400	chudlef@prose.dpi.qld.gov.au
Michael Clarke	Hassall & Associates Pty Ltd	02 9241 5655	mclarke@hassyd.aust.com
David Cook	University of WA	08 9380 3491	dcook@agric.uwa.edu.au
Venton Cook	Primary Industries SA	08 8226 0451	cook.venton@saugov.sa.gov.au
David Cordina	NSW Agriculture	02 6391 3633	david.cordina@agric.nsw.gov.au
Celia Cornwell	Agriculture WA	08 9368 3618	ccornwell@agric.wa.gov.au
Deane Crabb	PIRSA	08 8226 0342	crabb.deane@saugov.sa.gov.au
Lin Crase	La Trobe University	02 6058 3834	l.crase@aw.latrobe.edu.au
Jim Crosthwaite	Institute of Land and Food Resources	03 8344 5008	j.crosthwaite@landfood.unimelb.edu.au
Richard Damania	Adelaide University	08 8303 1933	richard.damania@adelaide.edu.au
Leith Davis	Forestry SA	08 8303 9966	davis.leith@saugov.sa.gov.au
Tom Davison	Dairy RDC	03 9602 5300	lmartin@drdc.com.au
Gerald Doeksen	Oklahoma State University	405 744 6081	gak@oksate.edu
Peter Donaghy	Department of Primary Industries	07 4936 0335	donahp@dpi.qld.gov.au
Andrew Downs	DNRE, Victoria	03 5482 1922	andrew.downs@nre.vic.gov.au
Lienbeth Dries	Kathdieke University Leuven	32 16 321618	lienbeth.diren@agr.kuleuven.ac.be
Alan Dube	SARDI	08 8303 9370	dube.alan@saugov.sa.gov.au
Charlotte Duke	DNRE, Victoria	03 9637 8350	charlotte.duke@nre.vic.gov.au

Participant	*Affiliation*	*Telephone*	*E-mail*
Ron Duncan	Australian National University	02 6249 4765	ronald.duncan@anu.edu.au
Brenda Dyack	University of Guelph	519 836 8544	bdyack@uoguelph.ca
Peter Eckersley	Agriculture WA	08 9780 6204	peckersley@agric.wa.gov.au
Geoff Edwards	LaTrobe University	03 9479 2170	g.edwards@latrobe.edu.au
Mark Eigenraam	DNRE, Victoria	03 9637 8352	mark.eiganraam@nre.vic.gov.au
Shenggen Fan	IFPRI	202 862 5677	s.fan@cgiar.org
Bob Farquharson	NSW Agriculture	02 6763 1194	bob.farquharson@agric.nsw.gov.au
Terence Farrell	Washington State University	509 335 7216	farrell@wsunin.wsu.edu
Matthew Ferris	EconSearch Pty Ltd	08 8357 9560	matferris@econsearch.com.au
Brian Fisher	ABARE	02 6272 2100	bfisher@abare.gov.au
William Fisher	DNRE, Victoria	03 9637 8346	william.fisher@nre.vic.gov.au
Rob Fraser	Imperial College	02 9380 2539	r.fraser@ic.ac.uk
Lana Friesen	Lincoln University	64 3 325 3627	friesenl@kea-lincoln.ac.nz
Qijie Gao	The University of Sydney	02 9351 4684	q.gao@agec.usyd.edu.au
Bruce Gardner	University of Maryland	1 301 405 1271	bruceg@arec.umd.edu
Robert Gillespie	Gillespie Economics	02 9804 8562	gillecon@ozemail.com.au
Juliet Gilmour	Australian National University	02 6279 8134	jgilmour@cres.anu.edu.au
Richard Gray	University of Seskatchewan	306 966 4026	grayr@duke.usask.ca
Garry Griffith	NSW Agriculture	02 6770 1826	garry.griffith@agric.nsw.gov.au
Bill Griffiths	University of New England	02 6773 2319	wgriffit@metz.une.edu.au
Ahmed Hafi	ABARE	02 6272 2081	ahafi@abare.gov.au
John Hamilton	DNRE, Victoria	03 5573 0719	john.hamilton@nre.vic.gov.au
Dennis Harbard	AMP Henderson Global	03 9655 3621	dennis.harbard@amp.com.au
D. Hatton MacDonald	CSIRO Land & Water	08 8303 8665	Darla.Hatton_MacDonald@adl.clw.csiro.au
Anna Heaney	ABARE	02 6272 2066	anna.heaney@abare.gov.au
Ben Henderson	University of WA	08 9380 3491	bhenders@agric.uwa.edu.au
Tracy Henderson	University of Queensland	07 3365 2480	S400640@student.uq.edu.au
Greg Hertzler	University of WA	08 9380 2534	greg.hertzler@uwa.edu.au
Christine Hill	DLWC, NSW	02 6971 4140	chill@dlwc.nsw.gov.au
Deborah Hill	ACIAR	02 6217 0500	hill@aciar.gov.au
Bruce Holloway	The Crawford Fund	03 9347 8328	hollowab@ozemail.com.au
Akm Hoque	NSW Agriculture	02 6799 1553	zioulh@mv.pi.csiro.au
Lyall Howard	National Farmers' Federation	02 6273 3855	lhoward@nff.org.au
Valerie Hristova	Office of Resource Development	08 8999 5093	valerie.hristova@nt.gov.au
Rosa Hulm	SA Housing Trust	08 8207 0550	hulm.rosa@saugov.sa.gov.au
Ben Jacobson	James Cook University	07 4781 4239	b_mm_jacobsen@primus.com.au
Sallie James	University of WA	08 9380 2514	sjames@agric.uwa.edu.au
Ian Jarratt	DPI, PAID	07 3239 3280	jarratti@dpi.qld.gov.au
Rohan Jayasuriya	NSW Agriculture	02 6391 3343	rohan@cheerful.com
Richard Jefferson	CAMBIA	02 6246 4502	r.jefferson@cabia.org
Kym Jervois	Office of Energy Policy	08 8226 5546	jervois.kym@saugov.sa.gov.au
Michele John	University of WA	08 9380 2514	mjohn@agric.uwa.edu.au
Robin Johnson		64 4 476 7493	johnsonr@clear.net.nz
Ann Jones	Productivity Commission	03 9653 2123	ajones@pc.gov.au
Robert Jorin	ETH Zurich	41 1632 5399	robert.joerin@iaw.agrl.ethz.ch
Timothy Josling	Stanford University	650 723 3438	josling@stanford.edu
Tarun Kanti Kundu	Yamagata University	81 235 24 0103	tarun@tds1.tr.yamagata-u.ac.jp
Maximilian Kapa	Muresk Institute of Agriculture	08 9690 1571	kappam@muresk.curtin.edu.au
Graham Kelleher	Graeme Kelleher & Associates	02 6251 1402	fgkelleher@ozemail.com.au
Geoff Kerr	Lincoln University	64 3 325 2811	kerr@lincoln.ac.nz
Ross Kingwell	University of WA	08 9368 3225	rkingwell@agric.wa.gov.au
Johann Kirsten	University of Pretoria	27 12 420 3248	jkirsten@postind.up.ac.sa

Participant	*Affiliation*	*Telephone*	*E-mail*
Mike Krause	Applied Economic Solutions	08 8396 7122	mike@appes.com.au
Dailin Kularatne	DNRE, Victoria	03 5833 5270	dailin.kularatne@nre.vic.gov.au
Padma Lal	ANU	02 6249 0093	padma.lal@anu.edu.au
Robert Lee	University of Adelaide	08 8303 7213	rlee@waite.adelaide.edu.au
Grace Leonello	Human Services, SA	08 8226 7366	grace.leonello@dhs.sa.gov.au
Rebecca Letcher	Australian National University	02 6279 8132	rebecca@cres.anu.edu.au
Rob Lewis	SARDI	08 8303 9397	lewis.rob@saugov.sa.gov.au
Hazel Lim-Applegate	ANU	02 6249 0155	hazel.lim-applegate@anu.edu.au
Bob Lindner	University of WA	08 9380 2563	blindner@agric.uwa.edu.au
Bith-Hong Ling	National Chung-Hsing University	+886 4 284 0392	bhling@dragon.nchu.edu.tw
Xian Liu	University of Sydney	02 6360 5834	xliu@orange.usyd.edu.au
Gordon MacAulay	Dept of Agricultural Economics	02 9351 2574	g.macaulay@agec.usyd.edu.au
Ian MacDonald	Lincoln University	64 3 325 3627 ext 8264	macdonai@lincoln.ac.nz
Sarah Mackay	Environment Waikato	64 7 856 055 ext.8947	sarah.mackay@ew.govt.nz
Donald MacLaren	University of Melbourne	03 8344 5035	d.maclaren@unimelb.edu.au
Neil MacLeod	CSIRO Sustainable Ecosystems	07 3214 2270	neil.macleod@cse.csiro.au
Rodney Maddock	Business Council of Australia	03 9610 4222	rodm@bca.com.au
Scott Malcolm	University of Deleware	302 831 1316	malcolm@udel.edu
Thilak Mallawaarachchi	James Cook University	07 4781 5206	thilak.mallawaarachchi@www-sugar.jcu.edu.au
Andrew Manson	PIRSA	08 8226 0553	manson.andrew@saugov.sa.gov.au
Marion March	DPIWE, Tasmania	03 6233 2886	marion.march@dpiwe.tas.gov.au
David Marchant	University Of Queensland	07 5429 6676	ddmarchant@smartchat.net.au
Mary Marchant	University of Kentucky	859 257 7260	mmarchant@ca.uky.edu
Michelle Marra	NC State University	919 515 6091	michele_marra@ncsu.edu
Sally Marsh	The University of Sydney	02 9351 4686	s.marsh@agec.usyd.edu.au
Tom Marsh	Kansas State University	785 532 4913	tlmarsh@agec.ksu.edu
Oswin Maurer	NZ Food Marketing Institute	64 7 838 4113	omaurer@waikato.ac.nz
Laura McCann	University of Western Australia	08 9380 3409	lmmcann@agric.uwa.edu.au
James McColl	McColl Consulting	08 8271 5576	
Geoff McLean	PIRSA	08 8303 9337	mclean.geoff@saugov.sa.gov.au
Erika Meng	CIMMYT	52 5804 2004	e.meng@cgiar.org
Nick Milham	NSW Agriculture	02 6391 3613	
Marta Monjardino	University of WA	08 9380 2536	mmonjard@agric.uwa.edu.au
Olive Montecillo	DNRE, Victoria	03 5482 1922	olive.montecillo@nre.vic.gov.au
Julian Morison	EconSearch Pty Ltd	08 8357 9560	jbmorison@econsearch.com.au
Michael Morris	CIMMYT	52 5804 2004	m.morris@cgiar.org
Paul Morris	AFFA	02 6272 5467	paul.morris@affa.gov.au
Mark Morrison	Charles Sturt University	02 6338 4253	mmorriso@csu.edu.au
Catherine MorrisonPaul	University of California at Davis	530 750 0417	cjmpaul@primal.ucdavis.edu
Marthin Nanere	La Trobe University	03 5833 2685	m.nanere@latrobe.edu.au
Tom Nordblom	Charles Sturt University	02 6933 2422	tnordblom@csu.edu.au
David Norton	SA Housing Trust	08 8207 0411	norton.david@saugov.sa.gov.au
Carol Nottenburg	CAMBIA	02 6246 4507	c.nottenburg@cambia.org
John O'Connor	National Council of Wool Brokers	03 9629 6287	johnoconnor@access.net.au
Garry Oborne	Primary Industries SA	8226 0512	Oborne.GarryT@saugov.sa.gov.au
Doreen Odom	University of New England	02 6773 2549	dodom@metz.une.edu.au
Jian-Wei Pan	Inner Mongolia Ac. of Soc. Sciences	0471 430 8907	jwpan22@hotmail.com
David Pannell	University of WA	08 9844 8659	David. Pannell@uwa.edu.au
Philip Pardey	IFPRI	1 202 862 8156	p.pardey@cgiar.org
Andrew Patterson	Patterson Rural Business M'ment	03 5572 5683	patto@iconnect.net.au
Liz Petersen	Australian National University	02 6249 4953	liz.petersen@anu.edu.au
Deborah Peterson	Productivity Commission	03 9653 2284	dpeterson@pc.gov.au
Jack Pezzey	Australian National University	02 6249 4143	pezzey@cres.anu.edu.au

Participant	*Affiliation*	*Telephone*	*E-mail*
Peter Phillips	University of Saskatchewan	306 966 8413	phillips@duke.usask.ca
Nick Piggott	North Carolina State University	1 919 515 4668	nick_piggott@ncsu.edu
Roley Piggott	University of New England	02 6773 2313	
Per Pinstrup-Andersen	IFPRI	202 862 5633	p.pinstrup-andersen@cgiar.org
Tanya Plant	University of Oxford	07 4692 8205	tanya.plant@geog.ox.ac.uk
Bradley Plunkett	Agriculture WA	08 9368 3434	bplunkett@agric.wa.gov.au
Jo Pluske	University of WA	08 9380 3427	jpluske@agric.uwa.edu.au
Jon Presser	Worldwide Project Management	08 8362 4775	jonp@project.com.au
Alan Randall	Ohio State University	614 292 6423	randall.3@osu.edu
Mahendra Reddy	University of South Pacific	679 313 900	reddy_m@usp.ac.fi
Austin Reid		8387 3355	areid@adelaide.on.net
Alan Renwick	University of Sydney	02 9351 2786	awr77@cam.ac.uk
Tami Reynolds	The Canadian Wheat Board	204 984 7819	tami_reynolds@cwb.ca
Alan Richardson	Australian Broadcasting Corp	08 8724 1011	
Bob Richardson	University of Melbourne	03 8344 5029	rrich@unimelb.edu.au
Ivan Roberts	ABARE	02 6272 2239	iroberts@abare.gov.au
Sherman Robinson	IFPRI	202 862 5604	s.robinson@cgiar.com
John Rolfe	Central Qld University	07 4980 7086	j.rolfe@cqu.edu.au
Glenn Ronan	PIRSA	08 8207 7903	ronan.glenn@saugov.sa.gov.au
Roger Rose	ABARE		rrose@abare.gov.au
Mark Rosegrant	IFPRI	202 862 5621	m.rosegrant@cgiar.org
Jim Ryan	Australian National University	02 6251 1942	ryanjim@cyberone.com.au
Kathy Salter	AFFA	02 6272 4940	kathy.salter@affa.gov.au
Steven Schilizzi	University of Western Australia	08 9380 2105	steven.schilizzi@uwa.edu.au
Fiona Scott	NSW Agriculture	02 6763 1156	fiona.scott@agric.nsw.gov.au
Phillip Simmons	University of New England	02 6773 2314	psimmons@merz.une.edu.au
Rajinder Pal Singh	NSW Agriculture	02 6951 2618	rajinder.pal.singh@agric.nsw.gov.au
Alexandria Sinnett	University of Melbourne	0419 110276	alex.ferris@bigpond.com
John Skerritt	ACIAR	02 6217 0559	skerritt@aciar.gov.au
Harley Smith	NSW Agriculture	02 6391 3635	harley.smith@agric.nsw.gov.au
Russell Soderland	Horticultural R& D Corporation	03 9210 9365	hrdcrs@ozemail.com.au
Lawrie Stanford	AWBC	08 8364 2828	lawrie.stanford@awbc.com.au
Bruce Stone	Crawford Fund	03 9347 8328	b.stone@latrobe.edu.au
Loris Strappuzzon	DNRE, Victoria	03 9637 8353	loris.strappazzon@nre.vic.gov.au
Randy Stringer	Adelaide University	08 8303 4821	randy.stringer@adelaide.edu.au
Sue Sutherland	Agriculture WA	08 9368 3343	ssutherland@agric.wa.gov.au
Jo Swinnen	European Commission		johan.swinnen@cec.eu.int
Carolyn Tanner	University of Sydney	02 9351 2573	c.tanner@agec.usyd.edu.au
Adrian Taylor	Hassall & Associates	02 9241 5655	dtaylor@hassyd.aust.com
Michael Taylor	Department of Agriculture	02 6272 4180	michael.taylor@affa.gov.au
Philip Taylor	PIRSA	08 8389 8819	taylor.philip@saugov.sa.gov.au
Richard Thompson	Murrumbidgee Irrigation	02 6953 0126	robertsonk@mirrigation.com.au
Stephanie Thorpe	PIRSA	08 8463 3131	thorpe.stephanie@saugov.sa.gov.au
Wei-Ming Tian	China Agricultural University	010 6289 1071	tianwm@sina.com
Lindsay Trapnell	University Of Melbourne	03 5762 1716	patland@hdc.com.au
Graham Trengove	PIRSA	8842 3565	gcmtren@rbe.net.au
Ray Trewin	ANU	02 6249 0134	ray.trewin@anu.edu.au
Norman Turkish			
Rod Tyers	Australian National University	02 6249 3364	rod.tyers@anu.edu.au
Mujib Ullah	University of New England	02 6773 3347	mullah@metz.une.edu.au
Martin Van Bueren	Centre for International Economics	02 6248 6699	mvbueren@intecon.com.au
Robin Vandergraaff	PIRSA	08 8207 7970	vandergraaff.robin@saugov.sa.gov.au
Thomas Wahl	Washington State University	1 509 335 6653	wahl@wsu.edu

Participant	*Affiliation*	*Telephone*	*Email*
Mandy Wallace	Dept of Premier and Cabinet (SA)	08 8226 2712	wallace.mandy@sagov.sa.gov.au
Malcolm Wegener	The University of Queensland	07 3365 2939	malcolm.wegener@mailbox.uq.edu.au
Bryan Whan	CRC Molecular Plant Breeding	08 8303 6539	rrcmph@waite.adelaide.edu.au
John Whitley	Adelaide University	08 8303 5540	john.whitley@adelaide.edu.au
Stuart Whitten	University of NSW	02 6268 8073	sm.whitten@adfa.edu.au
James Wilen	University of California, Davis	530 752 6093	wilen@primal.ucdavis.edu
Luke Wilson	PricewaterhouseCoopers	08 8218 7587	luke.wilson@au.pwcglobal.com
Rukman Wimalasuriya	DNRE, Victoria	03 9637 8356	rukman.wimal@nre.vic.gov.au
Glyn Wittwer	University of Adelaide	08 8303 4929	glyn.wittwer@adelaide.edu.au
John Woolfe	AWB Limited	03 9209 2550	jwoolfe@awb.com.au
Tinghui Xin	University of Queensland	07 3365 2174	S803767@student.uq.edu.au
Mike Young	CSIRO Land & Water	08 8303 8665	mike.young@adl.clw.csiro.au
Xueyan Zhao	Adelaide University	08 8303 3048	Xueyan .zhao@adelaide.edu.au
Zhangyue Zhou	The University of Sydney	02 6360 5661	zzhou@orange.usyd.edu.au