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Contents

page

i	Contents and Abstracts
ii	Editorial Board
iii	Foreword
iv	The character of AFBM Journal
v	AFBM Journal: Instructions to authors
1	George Antony, D Prestwidge, G Sandell, A Archer, P Thorburn and A Higgins Towards farming-systems change from value-chain optimisation in the Australian sugar industry
10	Dan Armstrong, C Ho, P Doyle, B Malcolm, I Gibb and S Brown Analysing drought impacts and recovery options by adapting a dairy farming systems modelling approach
17	Anna Barker and A Warren-Smith A comparison of fitness between horses with different exercise history
24	Mark N Callow, N Gobius and G Hetherington Development of profitable milk production systems for northern Australia: an analysis of intensification of current systems
38	Mark Frost and KA Parton The role of local production and the world price in setting local wheat, wool, and beef prices
46	Ian Grange, P Prammanee and P Prasertsak Comparative analysis of different tillage systems used in sugarcane (Thailand)
51	Sue Hatcher and PR Johnson Optimising genetic potential for wool production and quality through maternal nutrition
59	Christie Hoe, R Nessler, P Doyle and B Malcolm Future dairy farming systems in irrigation regions
69	David R Stevens, SJR Woodward and VFC Westbrooke Developing decision-making tools for improving pasture quality on deer farms in New Zealand
75	Garry EJ Wallace and AH Samsul Huda Using climate information to approximate the value at risk of a forward contracted canola crop
84	Research Posters Gallery

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Foreword

The volume 2 number 1 of *AFBM Journal - Farm Business and Farming Systems Management* - marks another cornerstone in the steady development of the international network of agricultural business and farming systems management related professionals, i.e. The Australasian Farm Business Management Network (AFBMNetwork).

Curtin University – Muresk Institute, Massey University – College of Sciences; Marcus Oldham College; The University of Malbourne – Institute of Land and Food Resources and Charles Sturt University – Faculty of Science and Agriculture are certainly creating a new culture of interinstitutional relationship on behalf of quality education, research, consultancy and extension for the primary sector of Australia and New Zealand. These are the organisations that hold membership to AFBMNetwork and liaise with the wider community of professional farmers and agribusiness managers throughout AFBMNetwork.

The year 2004 was a critical year for the future of AFBMNetwork and the consolidation of its major activities. It saw the creation of a Board of Management and the appointment of an Executive Officer; the launching of the webpage (i.e. www.afbmnetwork.orange.usyd.edu.au); the publication of vol 1 no. 1 of this Journal and the celebration of a most successful AFBMNetwork Conference with the sponsorship of The Rural Australia Foundation and the National Australia Bank - Agribusiness. This issue of AFBM Journal has the sponsorship of National Australia Bank since it contains the highlight papers of the 2004 NAB-AFBMNetwork Conference.

The year 2005 witnesses the volume 2 number 1 of this Journal with a series of papers that will surely bring a contribution to improving information in key areas and issues useful to the primary-sector professionals of Australia, New Zealand and around the world. I do not hesitate in recommending these papers to you.

A new innovative initiative of the Editorial Board of *AFBM Journal* is the creation of a Gallery for Research Posters. It is an innovative idea for those applied researchers who want to start extending their research ideas and outcomes to the wider community. I am sure this section will be an attractive cornerstone of this Journal.

My congratulations to the Editorial Board of *AFBM Journal* for this volume 2 number 1. I am sure it will be a new milestone not only for the strengthening of AFBMNetwork but also for the provision of high quality information for the primary-sector professionals who have the opportunity to gain access to the Journal pages.

John R Slade BB (AC with Distinction), FBMF Distinguished Member

Chairman AFBMNetwork

30 June 2005

The character of *AFBM Journal*

AFBM Journal is a DEST – Register of Refereed Journals of Australia registered publication of AFBMNetwork, with free online access to AFBMNetwork members and paid subscription for the online and printed copy to interested individuals and organisations.

The Department of Education Science and Training of the Commonwealth of Australia – Higher Education Research Data Collection (DEST-HERDC) defines that *the essential characteristics of a research publication* are as follows:

- substantial scholarly activity, as evidenced by discussion of the relevant literature, an awareness of the history and antecedents of work described, and provided in a format which allows a reader to trace sources of the work through citations, footnotes, etc
- originality (i.e. not a compilation of existing works)
- veracity/validity through a peer validation process or by satisfying the commercial publisher or gallery processes
- increasing the stock of knowledge (www.dest.gov.au/NR/rdonlyres/61C1FB66-A777-45AF-8FC5-C8EE5B380B5B/6127/2005HERDCSpecificationsFinal100605.rtf; accessed on 20 June 2005)

AFBM Journal will support its action in the above principles and while encouraging the publication of research results, useful to the professional farming related community, will undertake a stringent process of peer reviewing to ensure the quality of the papers published in the different issues of the Journal.

AFBM Journal is a publication venue for members of AFBMNetwork, a professional organisation supported by Curtin University – Muresk Institute; Massey University – College of Sciences; The University of Melbourne – Institute of Land and Food Resources; Marcus Oldham College and Charles Sturt University – Faculty of Science and Agriculture. However, independent and organisational professionals are encouraged to publish using the *AFBM Journal*.

AFBMNetwork vision and mission statements actively encourage the design of farming systems matched to the environmental, social, economic and marketing conditions of Australasia. It promotes quality education, research, consultancy and extension to service the primary sector and its organisations. The *AFBM Journal* will therefore publish high quality papers related to the areas of Animal Systems and Technology; Cropping Systems and Technology; Ecological Agriculture; Farm Economics; Global Perspectives of Agriculture; Business Management and Decision-Making; Social Issues of Farming and Sustainable Farming Systems.

AFBM Journal is published online where AFBMNetwork members have free access to the full contents of the papers using a password provided by the Executive Editor to the membership. Subscription to four printed issues and/or online access for non-AFBMNetwork members and organisations has a cost of A\$100 and can be processed contacting the *AFBM Journal* Executive Editor (i.e. afbmnetwork.chair@orange.usyd.edu.au - Tel BH +61 (0)2 6360 5506 or downloading a subscription form from the AFBMNetwork webpage.

Disclaimer: The views and opinions contained in the papers published in *AFBM Journal* are those of the authors and do not necessarily reflect the views of AFBMNetwork or any of its supporting organisations.

The Executive Editor

Towards farming-systems change from value-chain optimisation in the Australian sugar industry

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Contents

Introduction
Impacts on cane farming systems
• Regulation
• Harvesting
• Milling
• Marketing
• By-product use: non-cane biomass
Purposeful system design through value-chain modelling
Conclusions
Acknowledgements
References
Appendix

Abstract. The supply chain of the conventional Australian sugar industry is characterized by horizontal separation between the stages. Often antagonistic relations between segments, particularly farmers and millers, led to each developing their systems for their own segment's benefit, without reference to the wider industry interests. Cane growing developed into a monoculture, reliant on material inputs and technological solutions, whose low labour intensity afforded substantial lifestyle benefits to growers. Such a system worked well while the industry was the worldwide cost leader, but it has contributed to stagnating yields and left growers exposed to the industry downturn caused by Brazilian competition.

Over the past few years, CSIRO and BSES research aimed at securing industry-wide cost savings included the logistical optimisation of the harvesting and transport segments, harvest scheduling to maximise sugar yield, optimisation of the length of the harvest season, logistical aspects of export marketing, and inclusion of climate forecasts in industry decisions. Our results indicate that while costs and benefits of such system changes fall unevenly on various segments of the supply chain, there is scope for industry-wide benefits from changed practices in individual segments.

Some opportunities for downstream improvements identified in our research rely on changes in the farming system. The collection of most plant matter for electricity co-generation means an end to burning before harvest or green-trash blanketing. This, in turn, affects plant nutrition and water management by farmers. Sugar production can be improved by variety selection for location and soil types. Farm-layout changes can facilitate efficient harvesting, reducing not only harvesting costs but soil compaction and stool damage, in turn increasing yield. Crop rotations with legumes have promise for agronomic improvements and growing sweet sorghum may supply the mill outside the sugarcane season. The paper describes a number of such interactions between farming systems on cane farms and the rest of the sugar supply chain, including implications for segment-by-segment profitability.

Keywords: Australian sugar industry, farming systems change.

Analysing drought impacts and recovery options by adapting a dairy farming systems modelling approach

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Contents

Introduction

Method

- Case study
- Steering Committee
- Model
- Drought Analysis

Results and discussion

- Drought impact and recovery options for the traditional family farm system
- Drought impact and recovery options for the high input system
- In hindsight, how good was the modelling?
- Key factors associated with adaptability of the approach

Conclusions

Acknowledgements

References

Appendix

Abstract. The dairy industry in northern Victoria faced dramatic changes between 2001/02 and 2002/03. Drought resulted in a substantial decrease in availability, and subsequent increase in price, of irrigation water and supplementary feed. Most farms recorded substantial net cash flow deficits. Prior to 2002/03, a project had been established using case studies and a spreadsheet model to examine potential futures for different farm types. This approach was successfully adapted to examine drought impacts and recovery options under the vastly different prevailing circumstances. Several factors appear to have contributed to the adaptability of the approach, as follows:

- The approach considered many aspects of farm management systems, but was simple enough to allow adaptation.
- The project team and steering committee had developed a good understanding of the relationships between components of farming systems, enabling rapid adaptation of their mental frameworks.
- The approach focussed more on helping people question, discuss and learn, rather than providing an absolute answer.

Keywords: dairy farming systems, drought, farm management economics.

A comparison of fitness between horses with different exercise history

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Contents

Introduction
Materials and methods
Data analysis
Results
Discussion
Conclusion
Acknowledgements
References
Appendix

Abstract. Anecdotal evidence suggests that a horse's prior fitness level has an effect on the horse's ability to return to that previous level of fitness. This trial aimed to test this assumption which would benefit horse trainers to create individual fitness programs for horses. Standardised exercise testing was used to compare the progress of two groups of horses during weeks three and seven of a 14-week training program. Group A had undergone a similar training program twelve months previously and Group B had not. Plasma lactate samples and heart rate monitoring were used to assess the levels of fitness of the horses. Analysis of variance showed that there was no significant difference in post-exercise plasma lactate concentration between the groups. The horses with previous training experience (Group A) had lower (115.7 v 130.6 bpm) but non-significantly different heart rates than those without previous training experience (Group B) at week 3. This trend did not change after an additional 4 weeks of training (115.5 v 128.4 bpm; Group A and B respectively). Irrespective of training history or speed of each incremental step, there was no improvement in heart rate between week 3 (123.1 bpm) and week 7 (122.0 bpm).

Keywords: horse, fitness training, heart rate, blood lactate.

Development of profitable milk production systems for northern Australia: an analysis of intensification of current systems

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Contents

Introduction
Industry consultation to identify factors limiting dairy production in northern Australia
Identifying production systems
Discussion
Acknowledgements
References

Abstract. Milk producers in northern Australia are attempting to make rapid adjustments to production systems that enable them to compete in a newly deregulated market, although there is uncertainty about how to do this. Through industry consultation and expert review a process was developed to identify production systems that may be capable of supporting economic targets of 10% return on assets and 600,000 L milk/labour unit. A broadly based project team in terms of disciplines then used this process to identify five production systems which were each applicable to substantial numbers of current milk producers. These were modelled using whole farm economic analyses and annual feed planning, using an iterative process over an extended period, to determine the economic and physical parameters of each system when achieving the above economic targets.

All five systems achieved substantial increases in milk output from present natural resource bases, and require herd sizes from 280 to 900 cows to achieve targets. The models showed a high sensitivity to return on assets in relation to milk price, herd size and milk yield per cow, and less sensitivity to variation in input costs. It was concluded that substantial increases in milk output from farms are needed to meet economic criteria, and that the natural resource base is capable of supporting these increases. The financial risks of such increases largely relate to the difficulties in maintaining cash flow during a period of rapid capital investment and expansion. It is also accepted there are environmental risks if such rapid development takes place, though these require further quantification.

Keywords: farmers, learning, farm management education.

The role of local production and the world price in setting local wheat, wool, and beef prices

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Contents

Introduction
The Australian dollar as a commodity currency
The role of Australian beef, wool and wheat
Beef cattle
Wool
Wheat
Do the results support this?
Conclusions
References

Abstract. The Australian dollar is considered primarily a commodity-based currency. The high level of commodity-based exports in Australia's trade balance is given as an explanation. Accordingly changes in world commodity prices should bring commensurate changes in the value of the Australian dollar, such that changes in world commodity prices are only partially transmitted to the Australian economy and local farm-gate prices.

If this relationship holds, then local farm-gate prices should be significantly less volatile than their respective world price. Variances in local prices would be due to local factors (e.g. variances in local production) rather than variances in the world price and international factors.

This paper examines the farm-gate prices of Australia's three largest agricultural commodities, wheat, beef, and wool; seeks to establish if the variances in these prices are more closely related to movements in their respective world price or local production factors and, if movements in the Australian dollar decrease local farm-gate variance as expected.

Keywords: farm economics, farm business management, agricultural risk management, commodity prices.

Comparative analysis of different tillage systems used in sugarcane (Thailand)

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Contents

Introduction
Materials and methods
Results and discussion
Conclusions
References
Appendix

Abstract In order to reduce the impact of decreasing profit margins in crop production systems, all possible options that will increase net profits need to be explored. Land preparation and stool removal in sugarcane production can be a major contributor to overall production costs. Since estimates that mechanization can contribute as much as 50% of the total production costs, considerable savings can potentially be made if the number of tillage operations is reduced. Such savings however, have to be offset against other costs associated with minimum or no-tillage systems, such as the increased need for herbicide. In addition, conventional tillage systems have been implicated in yield decline over the long-term and therefore yield benefits are envisaged, together with cost savings, by the adoption of minimum and no-tillage sugarcane production. A comparative analysis of five sugarcane tillage systems using data from eight years, showed that minimum tillage, with mechanical stool removal and machine planting gave the best economic returns, being 29.3 and 39.4% more profitable than the conventional and no-tillage treatments, respectively. Other minimum tillage treatments, with sub-soiling and machine / manual planting combinations also performed well. Whilst the no-tillage treatment made substantial savings from the non-use of machinery, these were offset to a large degree by the extra costs associated with herbicide use and extra labour requirements.

Key words: minimum tillage, no-tillage, net profit, profit margin, sugarcane.

Optimising genetic potential for wool production and quality through maternal nutrition

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Contents

- Introduction
- Genetic potential – can we maximise it?
- The follicle group – initiation and maturation
 - Primary follicles
 - Secondary follicles
 - S/P ratio
- Maternal effects and the follicle population
 - Breed differences
 - Timing of the nutritional stress
- Follicles and the fleece characteristics
- Matching the breed cycle to feed availability on the farm
- Implications for commercial wool producers
- Lifetime Wool – optimising wool production and quality
- Conclusion
- References
- Appendix

Abstract. This paper reviews the development of the wool follicle population with a view to the management of breeding ewes so as to optimise the genetic potential of the progeny for wool production and quality throughout their lifetime. It highlights the importance of the pre-weaning environment (i.e. maternal nutrition through pregnancy and lactation) on the initiation and maturation of the secondary follicle population and identifies the last third of pregnancy as the most critical period. The implications of this for the commercial wool producer are discussed in terms of matching the breeding cycle of the ewes to available pasture and provision of supplementary feed. Finally, it introduces a national project 'Lifetime Wool' funded by Australian Wool Innovation which aims to develop profitable ewe management guidelines for wool growers across Australia to adopt in order to optimise the genetic potential of their flock for wool production and quality.

Keywords: genetic potential, follicle development, breeding ewe, nutrition, lifetime wool.

Future dairy farming systems in irrigation regions

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Contents

- Introduction
- System 1: Traditional family farm
 - Current farm system and potential options
 - Results
 - Sensitivity analysis
- System 2: Modified family farm
 - Current farm system and potential options
 - Results
 - Sensitivity analysis
- System 3: High input farm
 - Current farm system and potential options
 - Results
 - Sensitivity analysis
- System 4: Feedlot farm
 - Current farm system and potential options
 - Results
 - Sensitivity analysis
- Conclusions
- Acknowledgements
- References
- Appendix

Abstract. The dairy industry in northern Victoria has been subject to rapid change in recent years, resulting in great diversity in the irrigated dairy farming systems in the region. Continuing analysis is needed of the various farming systems that may be viable in the future. This study examined possible development options for different farm systems to enable them to maintain financial viability. Four case studies, representative of different farm systems, were used. All four had options to combat the effects of declining terms of trade. However, the option most suitable for one case study may be unsuitable for another farm due to differences in resources, goals or skills. A key outcome of the study was the development of a robust approach to continually analyse farm physical and economic performance in a rapidly changing environment. Importantly, options can be analysed, enabling business managers to evaluate risks and reach informed decisions on investments.

Keywords: dairy farming systems, irrigated dairy.

Developing decision-making tools for improving pasture quality on deer farms in New Zealand

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Contents

Introduction

Methods

- Focus groups

- Software development

Results from the focus group

- Theme 1: identifying the right pasture quality

- Theme 2: management systems to maintain sustainability

- Theme 3: maximising the potential of livestock

- Packing the themes within the Pasture Quality Workshop

Modifying the pasture quality workshop programme for deer farmers

Logistics of the workshops

Future feedback

Conclusions

Acknowledgements

References

Appendix

Abstract This paper describes the development of a learning package to support improved pasture quality on New Zealand deer farms. The first step has been to determine the specific requirements of deer farmers that will enable them to improve pasture quality decisions on-farm. Decision support software that interprets and demonstrates the impacts of pasture quality and animal physiology on the performance of young growing deer has also been developed. Key themes identified to aid pasture management decision-making included identifying the right pasture quality, management systems to maintain pasture quality and maximising the potential of livestock. This paper reports on the type of knowledge that deer farmers require in the learning package.

Keywords: decision making, deer, growth rate, learning packages, pasture quality, software.

Using climate information to approximate the value at risk of a forward contracted canola crop

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Contents

Introduction
Model development
The decision problem
Input data
Example case study
Discussion
References
Appendix

Abstract. In recent decades farmers have used financial instruments such as cash forward contracts to lock-in a price for increasing proportions of their crop through different stages of the production cycle. Given the high variability of the Australian climate this practice has inherent risk with drought induced crop failure being significantly probable. Under failed crop conditions farmers buy themselves out of the contracted position at prevailing prices thereby compounding the financial burden of crop failure. This paper reports on the role of the relatively recent developments in climate prediction, based on the SOI phase system, to develop crop yield probability distributions using regression approximation and to evaluate the Value at Risk of establishing a forward contracted position. Value at Risk is here defined as the 5% interval of the probability distribution of Enterprise Gross Margin and is used to ascertain the capital adequacy of a business in the face of a worst-case scenario.

Keywords: Canola crop, agricultural risk management.

Research Posters Gallery

Scientific Editor

Assoc Professor Geoff Gurr

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The Gallery of Research Posters is an innovative section of *AFBM Journal*. Herein researchers may submit their research posters mainly aiming for feedback from a wider reading audience.

Posters may contain material ranging from early planning and background for research projects, preliminary results to final research outcomes.

The posters submitted to this section of *AFBM Journal* will be reviewed by the Scientific Editor of the section, Associate Professor in Applied Ecology Geoff Gurr, who will make the decisions on approval for publication.

Authors interested in publishing their research posters may submit them for consideration to: afbmjournal@orange.usyd.edu.au