



## Farming families and Decision-Systems Theory

Dr Quentin Farmar-Bowers and Dr Ruth Lane

### Introduction

This article provides a brief introduction to Decision-Systems Theory (DST). DST was developed from in-depth interviews with thirty-three farming families and provides an explanation of how farming families make strategic decisions about their lives and farming careers (Farmar-Bowers and Lane, 2008 in press).

Understanding the processes farming families use in making strategic decisions could help (1) other farmers with major decisions, (2) people wanting to develop rural communities and (3) agencies with the responsibility for rural policy and sustainable development.

### Decision-Systems Theory

Decision-systems theory provides a comprehensive explanation of the processes farming families use in making strategic decisions. It sits within a systems-thinking framework. DST is still being refined and more farmer interviews are being conducted in Australia and New Zealand.

Decision-systems theory contains five concepts:

#### Concept 1: 'Motivational stories'

Farming families (FF) have family aspirations. Although the content of these aspirations differ the purposes are similar and we describe these purposes in a set of five 'motivational stories'. These stories are what families are working to achieve or have on an ongoing basis. They are the 'ends' that families are striving for; such as being competent people and farmers, raising children who are resourceful and responsible and enjoying what they do in life.

#### Concept 2: Suitability and availability of opportunities

Opportunities are the 'means' farming families create to actively satisfy these 'ends' (the motivational stories). The opportunities they seek are limited to those that seem 'suitable' for satisfying their family's aspirations (the motivation stories), using the components that are actually 'available' to their family. The components for farm business opportunities are (1) Personal; i.e. time, skill, knowledge, land and machinery they own, money they have etc. (2) External; i.e. markets, finance, infrastructure, water to buy, land to lease etc. (3) Random; i.e. droughts, fires, market fluctuations etc. Other opportunities they create, such as educational or recreational opportunities use different components but they fall into the same three categories.

#### Concept 3: A two tier hierarchy of decision-systems

Decision-systems describe how decisions are grouped together in terms of topic and in a hierarchical sequence. The first tier in this hierarchy, the 'family decision-system', is the clearing house where issues are negotiated within the family and the decisions set the scene for all subsequent decisions. "Shall we stay farming?" is the kind of question negotiated in the family decision-system. Decisions are justified in terms of 'care ethics'; 'what is best for the family and individual family members.'

There are dozens of topics relevant to farming families and so there are dozens of decision-systems in the second tier of the hierarchy. The two decision-systems that concern land-use on the farm are the "farm trading business decision-system" and the

"land ownership decision-system". These are where the technical and economic decisions about the farm business are made. These decisions are justified in terms of business ethics: 'what are the most profitable options?'

#### Concept 4: Personal career paths

Family members often work together in farming but individuals have differing interests, capabilities and aspirations that need to be accommodated. Also, the decisions people make change as they move through life. For example, people about to retire from farming tend not to start up new farm enterprises or take on new debt, although they probably would have done both when younger. The personal

*cont next page*

### IN THIS ISSUE

**Farming families and Decision-Systems Theory 1**  
Dr Quentin Farmar-Bowers,  
Dr Ruth Lane

**Global Warming and APEN 4**

**Extending Complex Agricultural Research in Australia - The case of integrated parasite management in sheep 6**  
Lyndal-Joy Thompson

**New APEN Members 7**

**Notice of AGM 8**

**Cluster Coordinators 8**

**Contact Details 8**

career path concept allows these factors to be recognised and negotiated within the family. For example, spouses may work cooperatively on farm businesses but agree for family and personal reasons to make substantial commitments in other roles which take them down differing personal careers paths.

**Concept 5:** Lenses – how decision makers view options

There may be hundreds of options at any one time but the decision-makers in a farming family whittle them down to just a few by

viewing them through a sequence of ‘lenses’.

Figure 1 show the “Concept of Lenses” diagrammatically. The broad arrows are suggestive of this ‘whittling down’ process in which decision-makers concentrate their energy on creating and developing the opportunities that they feel are best for them and best for their family’s welfare.

For example, a farmer may (1) have a personal interested in grape production (2) grape growing would provide a good family income and allow time for socialising within the family (3) the farmer has suitable land, money, time and the knowledge to establish a vineyard (4) grape growing is socially acceptable (5) there is a market for grapes, vines can be purchased locally and finance is available from the bank. Having run through this planning exercise a few times to identify the best options, the farming family may make the decision to get to work and create and implement a grape growing opportunity.

**Three ways DST could help farming families and farming communities:**

**Use one:** improving farming families’ strategic decision making processes

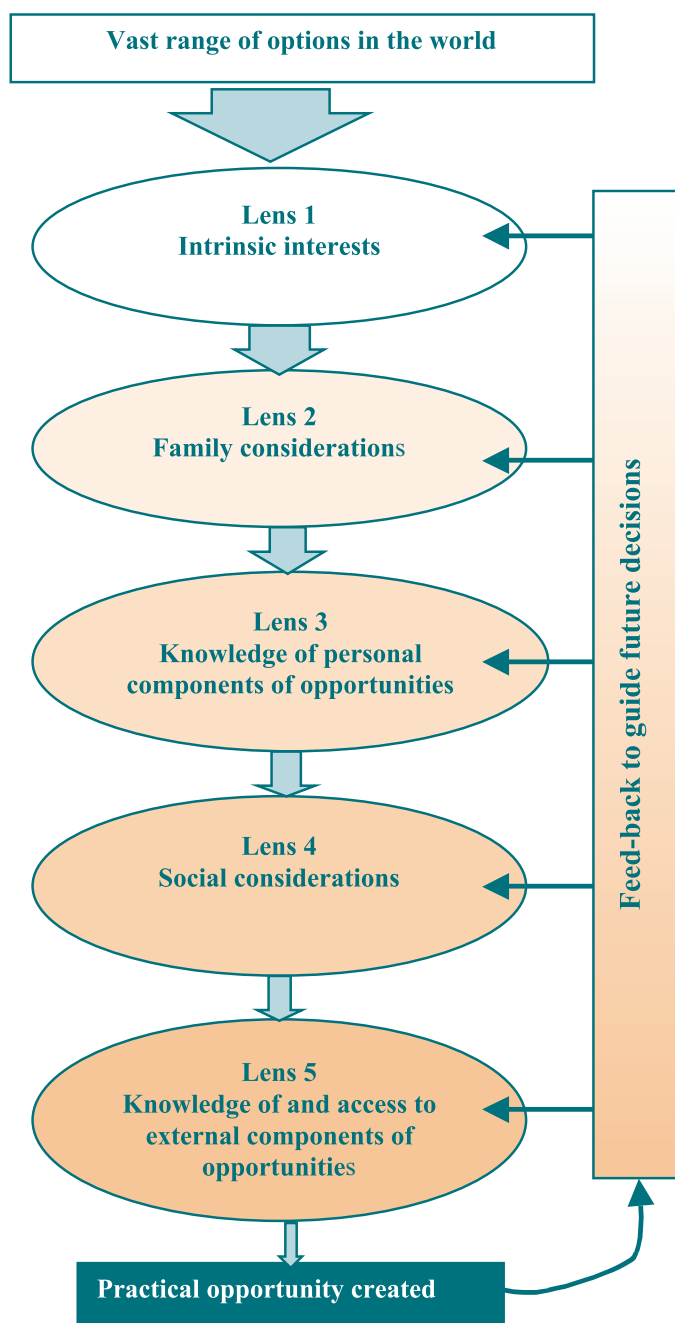
DST provides a systems-thinking framework to help farming families appreciate the processes other farming families use in making strategic decision and this can help them develop their own decision-making processes and gain confidence in their own abilities.

**Use two:** community development

Agricultural policies that focus exclusively on the business decision-systems (and not other decision-systems such as education) concentrate on the efficient use of the resources used in farming. These programs may not lead to the continuance of farming families in agriculture, but rather lead to the expansion of farm size, their incorporation, and the entry of large companies aiming to take advantage of the economies of scale in resource use and their relatively good access to external components of opportunities, especially to markets, managerial skill, new technologies and finance.

The motivation stories show that farming families want a fulfilling future for themselves and for their children. They recognise that this requires an environment that is fully functioning (i.e. not polluted or deficient) and also a supportive society; the bases of sustainable development. DST suggests the effectiveness of rural policies and programs depend on their capacity to generate new external components

Figure 1. The Concept of Lenses in the creation of practical opportunities



## Farming families and Decision-Systems Theory

Continued from page 2

for opportunities that support farming families' aspirations (their motivation stories). Therefore, new components are needed to create opportunities that not only help farm profitability and protect the environment but also maintain a supportive society.

### Use three: policy development

Agencies could increase the effectiveness of sustainable development policies by matching them to the decision processes used by farming families. This is described in DST by the concept of 'boxes of influence' which provides a classification system for influences (e.g. policies) over a farming entire career. Briefly, policies aimed at improving business or the efficient use of resources should develop the external components needed by farmers to create profitable business opportunities. Policies with non-business objectives such as landscape and biodiversity maintenance, and inter-generational equity should develop the external components needed by farming families to create opportunities to care for their environment, and their communities.

DST provides an effective social-learning framework for rural communities to work cooperatively with Governments to develop external components of opportunities that are relevant to regional rural affairs. An iterative model for this is set out in figure 2 as a 'snapshot' of the community / farming family / government / global ideals learning processes. In contrast, the concept 'Boxes of influence' provides a way of understanding how farming families might react to policies at different periods throughout their farming careers.

### References

Farmar-Bowers, Q., Lane, R., (2006), Understanding Farmer Decision Systems That Relate To Land Use, Report to the Department of Sustainability and Environment, Victoria, School of Global Studies, Social Sciences and Planning, RMIT University, Melbourne <http://eprints.infodiv.unimelb.edu.au/archive/00001842/>

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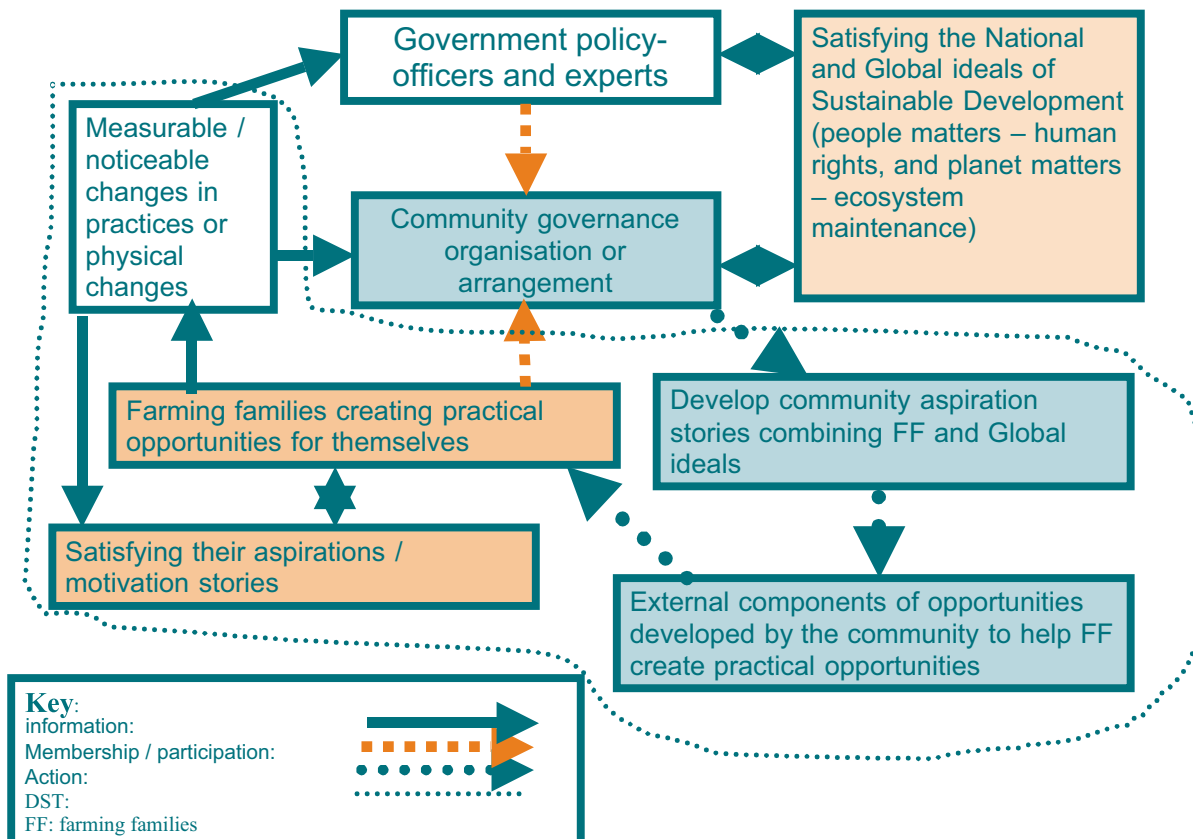
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Figure 2. How DST could be used in a community governance approach for sustainable development



# Global Warming

## What should APEN's position be?

Over the last couple of months this question has been included in the APEN eBulletin, with the following preamble:

**“The Management Committee has been approached by some members to take a stance on this issue (Global Warming) on behalf of our members. We are seeking comments from our members as to what position do you think APEN should take regarding the entire issue of Global Warming (including National Emissions Trading Scheme, Australian Government's Caring for Our Country funding opportunities, improved Natural Resource Management, agricultural industry's adaptation and mitigation efforts regarding climate change?)**

What activities could/should APEN pursue/embark on to support you, our members regarding global warming and climate change related issues as they emerge in the Australasian-Pacific context?”

With permission, the comments received from members have been as follows:

### John Petheram

I don't see that APEN needs to have a position or to make a statement about Global Warming itself. [No more than we need to make a statement about 'biodiversity conservation' or efficient water use - or other areas that we happen to work on with our clients or organisations.]

However, it is very clear than many APEN members already face (or will face) the challenges of working to influence peoples' behaviour related to the use of resources in a way that is more sustainable in terms of carbon emissions (and other climate related issues like water use). This is because many extension professionals work in NRM agencies, or with agencies concerned with resource use in ag. or community health etc - that are likely to be impacted on by global warming.

This is interesting for the profession because it takes us back to the 'bad of days' in extension, when we felt we had important messages to get across to the (largely ignorant?) public, and we developed simple theories of adoption and diffusion and adoption behaviour that have largely fallen out of favour nowadays. Mass media techniques that were also used very powerfully in ag. and health extension have also started to become important in spreading awareness of global warming.

So in training facilitators working with 'climate change organisations' we now see the old theories of adoption and diffusion coming out of the closet. I even heard a behavioural psychologist quoting Roger's early work and talking of early and late adopters and laggards etc., and applying this as a model for understanding behaviour change among people in relation to their actions for alleviating climate change in the home and the wider community.

I like those old models and see no reason why they can't be combined with more modern models and approaches like participatory action, co-learning, and adaptive learning, especially in working with the many community-led climate change groups that have formed around the country. There is not only a vast information gap and need to improve

awareness of the severity of climate change issues, but a huge need for extension agents to lead communities and groups in the process of seeking direction and developing solutions to tackling climate change issues in their regions, states and nations.

That is - unless you happen to be someone in climate change denial - which is another matter. In that case you have a really really big extension task ahead of you, now that the tide has finally turned, people are studying the data available, and have started to become very concerned about the need to change for the very survival of their businesses and families. In my view APEN cannot take a position on the voracity of the data on global warming, but as extension professionals most of us will be working with organisations or companies already committed to alleviating causes and effects of climate change: we will be very occupied with assisting communities that we work in understand the data and the consequences on a local basis, seeking possible ways of alleviating effects, and then developing ways to change behaviour appropriately. This will take all our accumulated extension theory and skills.

Note:

I can't see that working on global warming issues contradicts APEN's aims or strategic plan etc. However, I have always objected to that VISION statement that confines us to working with "NRM Communities". I believe APEN includes people working on health and many other (environmental) issues - and if the Mission statement was as wide as it should be, Global Warming could be seen as even more core business - as it affects everyone in all communities.

### Bruce McGregor

There are several issues that APEN can include in their position paper that will support many rural people. The main points are:

1. The emission trading cap should be reduced by the amount of emission reduction already achieved by current actions. This will ensure that people making efforts to



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- John Petheram

## Global Warming

*Continued from page 4*

reduce their own emissions do not allow others to increase their emissions. This sounds contradictory but the current Garnaut Recommendation is for a capped emission trading system which provides an upper limit to emissions. If you purchase green power, put in a solar system etc this reduces your emissions but allows someone else to emit more. It works this way: the sum of less of your emissions plus the greater emissions from someone else (aluminium smelter, coal fired power station) do not exceed the cap. What is needed is a system that ensures that efforts to reduce emissions result in the cap being reduced. Such a system should include the investment that people have already made in renewable energy e.g. solar, wind, energy efficiency etc. Otherwise what is the benefit of individuals reducing their emissions?

2. The Emissions trading system urgently needs to include Biocarbon. That is carbon in the ecosystem, plants, animals, soil, etc. - which acts as a long-term storage for carbon. For farmers and rural people this could be as a result of managing soil to increase soil carbon, or letting their forests grow more. However short-term tree planting is not relevant as it is short-term and does not increase long-term storage.

3. Objectives of the carbon tax fund must be to reduce long-term emissions and reduce our dependence on fossil fuels. About 20-30% of the carbon tax will be used in this area. This money must be used to implement emissions reductions so we become more sustainable and use renewable energy e.g. insulate homes, subsidise solar and wind power etc. There will be political pressure to spend this money on subsidising the worst polluters, which should be specifically prevented.

### Darren Schmidt

Global warming/climate change

I believe APEN's position on this should be apolitical to the extent that it is of no real benefit to the organisation if it "declares its hand" on the issue. I believe to do so would be to confuse the process with the outcome. We extend horizons; we shouldn't necessarily seek to define those horizons or judge them unworthy or otherwise.

APEN could support its members by providing knowledge and skills support to people in the community who want to galvanise action, assess community feeling, promote a line of thinking or even push a political barrow. These are all legitimate extension-related activities that are rightfully within APEN's ambit. But to go past that and take a political

standpoint, regardless of that standpoint's "appropriate-ness", seems to me to smack of grandstanding. There are hundreds of other political issues on which we could similarly take a stand. It is sensible that we so far refrain from doing so.

I think APEN should encourage its members to take an individual stand on the issue and pursue actions they feel are appropriate and useful. I think it should also maintain a policy of reducing emissions footprints by, for example, using teleconferencing when and where possible (acknowledging this already happens). But to stand in judgement of other organisation or bodies for a particular stance (for APEN would be inviting such a criticism) or to overtly declare a position on global warming or one of its derivatives goes too far.

I'm happy to record and discuss my personal views on climate change. They lean heavily toward reducing emissions and analysing very carefully (and reducing) our energy needs. I neither hope nor expect that APEN would share this view (or its opposite, for that matter).

### Bryan Johnston

Keep members informed of debate, current information, issues, implication for industry and funding etc.

### Andrew Huffer

Re Global warming

Yes it's an issue of huge interest to me.

Should APEN advocate, lobby or be an activist on Global Warming? NO

Let's remember to check in regard to what brings the members together, what our vision and mission is and stick to that.

I'm a member of APEN to build networks, share info, develop myself professionally & get more clients (yes I'm honest on this).

People wanting to further heighten the profile of global warming and influence behaviour on this can do so through other networks - using extension principles learned through APEN :)

APEN can model being a good environmental citizen by continuing to use energy-efficient practices that minimises its footprint.

I'm happy for this to appear in any feedback to members

Others have commented that they don't think APEN should have a position.

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We extend horizons; we shouldn't necessarily seek to define those horizons or judge them unworthy or otherwise.

- Darren Schmidt

Should APEN advocate, lobby or be an activist on Global Warming? NO

- Andrew Huffer

The Management Committee appreciated the comments received from members. The views were considered and it was decided at an MC teleconference that APEN needs to recognise the changing environment and determine what we can provide in terms of support for members rather than having a policy statement, as such, on global warming.

# Extending Complex Agricultural Research in Australia:

## *The case of integrated parasite management in sheep*

Lyndal-Joy Thompson



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The project focussed on employing a multidisciplinary approach to a complex management issue with the aim of developing regional integrated parasite management programs that reduced the unnecessary use of chemicals, slowed the rate by which target parasites developed resistance to chemicals of control and maintained animal production.

In 2003 a project called Integrated Parasite Management in sheep (IPM-s) commenced, involving researchers across Australia. The project was funded by Australian Wool Innovation Ltd and involved collaboration between the University of New England, the University of Melbourne, Department of Agriculture and Food, Western Australian and the Department of Primary Industries and Fisheries, Queensland. The project focussed on employing a multidisciplinary approach to a complex management issue with the aim of developing regional integrated parasite management programs that reduced the unnecessary use of chemicals, slowed the rate by which target parasites developed resistance to chemicals of control and maintained animal production. Components of the project included demonstration farms implementing IPM management techniques, critical scientific research on parasites and the socio-economic aspects of current parasite management and the potential for adoption of an integrated system. The need for the study arose out of the growing incidence of parasite resistance to chemical treatments, which for sheep includes lice, blowflies and worms. This article outlines the socio-cultural component of the IPM-s program, which was carried out as part of a PhD project.

**IPM Requires Management Changes:** The adoption of principles being developed by the IPM-s project will require producers to make incremental, but significant, changes in their management approach. Specifically, these changes may require producers to utilise a broader range of management practices for parasite control than that to which they are accustomed under a drench-reliant system. As with any innovation, whether a product or a management tool, there may also be uncertainties associated with production and business aspects of sheep production associated with the implementation of IPM-s. All of these factors will have an impact on the adoption of integrated parasite management practices and the ultimate success of the project. An understanding therefore of current parasite management practices, and the perceptions held by producers about parasite control was viewed as an important aspect of the design of extension programs for the IPM-s

project. The PhD project related to this aspect of the IPM-s project investigated the factors likely to have an impact on the adoption of the knowledge, skills and practices associated with IPM-s.

**Benchmark Survey:** The initial data source for the PhD project and for the socio-economic component of the IPM-s project, involved the design of a benchmark survey to identify the current status of parasite management by diverse wool producers around Australia. The survey was also designed to aid in the identification of key performance indicators that could be used in survey instruments in the future to gauge any changes in parasite management in the Australian sheep industry that might be related to the IPM-s project and subsequent extension of the outcomes of this project. The survey and related report have provided AWI, and other stakeholders in the wool industry, with current and comprehensive information about the parasite management practices currently employed by Australian wool producers in each of the different, major, wool production regions of Australia. It also provides comprehensive detail about the demographics and farm physical characteristics of Australian sheep producers.

**Research Questions:** The second component of the PhD research identified four research questions related to agricultural extension, decision-making and adoption.

- Are logical choice models of decision-making useful representations of the decision-making process that producers can apply in a practical manner?
- How can research into the adoption and extension of agricultural innovations benefit from a qualitative understanding of the psychological and socio-cultural aspects of decision-making?
- Are personal construct theory and the repertory grid technique a useful methodology for investigating the psychological and socio-cultural aspects of agricultural adoption and extension?
- What factors might impact upon the adoption of integrated parasite management for the control of worms in sheep, and what might be the variation in these factors across

## Extending Complex Agricultural Research in Australia

Continued from page 6

the population of sheep producers in south east Australia? This includes understanding the differences between researchers and producers in beliefs as to what knowledge and skills are required for competent management of parasites in sheep.

In order to meet the goals of the IPM-s project and investigate the research questions identified, four methods were employed, including the nationwide benchmark survey, a Delphi process with IPM-s researchers, and focus groups and personal interviews with sheep producers. The personal interviews adopted a personal construct theory approach and utilised the Repertory Grid as a basis for the interview approach. Focus areas for the focus groups and interviews included south-east Victoria and the New England Region of New South Wales.

Impediments to adoption of IPM-s: Outcomes from the survey methods employed, included the following. Personal Construct Theory and the repertory grid technique were found to be valuable for examining producer perceptions of IPM-s practices. This methodology allowed the identification of several key factors believed to influence producer decision-making. Specifically, there exist several over-arching socio-cultural factors that influence decision-making for worm parasite management. These factors included uncertainty, self-identity, and management control and comfort.

Further, sources and types of knowledge

there exist several over-arching socio-cultural factors that influence decision-making ... uncertainty, self-identity, and management control and comfort.

were indicated to be of importance, particularly as this related to the abovementioned factors. Producers and researchers were found to hold strong beliefs about particular types of knowledge, with producers indicating procedural knowledge to be very important, and researchers conceptual knowledge. These differences have the potential to affect extension of the project due primarily to communication issues, but also potentially due to issues of trust. Finally, the study also identified several practices that are key components of any IPM approach, which are potentially problematic for extension. These practices present difficulties primarily because of the way in which they are currently perceived, and in some cases used, by many producers. Such practices include Worm Egg Counts testing, Drench resistance testing and the selection of Epstein-Barr Virus-tested rams. There is more work to be done in this area, particularly the focus on socio-cultural aspects influencing adoption and how these factors can be recognised in extension programs and as well as in the research development process.



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## New APEN members

If you've recently joined APEN, welcome! You'll reap plenty of professional and personal rewards. If you've been in APEN for a few seasons now, be sure to say hello to the new members.

And a reminder to existing members: if you wish to access the member's page on the APEN Website ([www.apen.org.au](http://www.apen.org.au)) go to the member's only page and enter your email address (as per the APEN database) and your membership number. Any queries, contact Roe at the APEN Secretariat ([info@apen.org.au](mailto:info@apen.org.au)) or 02 6024 5349.

Welcome to these new members who have joined since last edition. We're glad to have you on board.

<b>Sally Murfet</b>	Tas
<b>Bryan Gorddard</b>	WA
<b>Barbara King</b>	Vic
<b>Ron Master</b>	WA
<b>Kevin Brown</b>	Vic
<b>Bruce Wright</b>	ACT
<b>Kate Charleston</b>	QLD
<b>Chris Wheatcroft</b>	WA

## Notice of APEN AGM– MC positions for election

Nominations are called for the positions of:

- *President,*
- *NT Regional Coordinator*
- *Tasmanian Regional Coordinator*

The AGM will be held by **teleconference on November 27 at 2pm EST.**

Nominations are due in to the Secretariat a month before – by October 30, 2008. Nomination forms are available from the website [www.apen.org.au](http://www.apen.org.au) or from Roe at the Secretariat.

Information on the roles and responsibilities is available from the Constitution which can be found on the website, or from Roe.

## Cluster Coordinators

Cluster Coordinators are contact points in the regions and ideally help organise APEN events with the Regional Coordinators who sit on the APEN MC representing their region. We currently need Cluster Coordinators for:

- *SE Qld*
- *NT*
- *SA*
- *Tasmania, and*
- *Melbourne*

If you are interested in being a Cluster Coordinator and building the APEN Network in your region please contact Roe at the Secretariat or through your Regional Coordinator. Their contact details are on the APEN website [www.apen.org.au](http://www.apen.org.au)

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## Guidelines and deadlines

*Submissions should be made in MS Word 6.0 with minimal formatting. A portrait photograph of the author is required. All photographs, figures and/or tables ought to be provided as separate files (preferably TIF or JPEG; photos scanned at 300 dpi). Feature articles should be around 1000 words and minor articles 500 words. The editor reserves the right to edit submitted material to meet space restrictions. Letters to the editor or general items of news of interest to the network are welcome. Articles should be submitted at least four weeks prior to publication.*

*Preference is given to articles that are grounded in some form of project or event.*

**Editing:** Rosemary Currie, John James.

**Layout:** Ross Tasker, Snap Printing Wodonga, Victoria.

**Production management:** Rosemary Currie, APEN Secretariat, Wodonga, Victoria.

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**Stories and photos (next edition) due to Editor 30 November 2008**