



Extending Horizons

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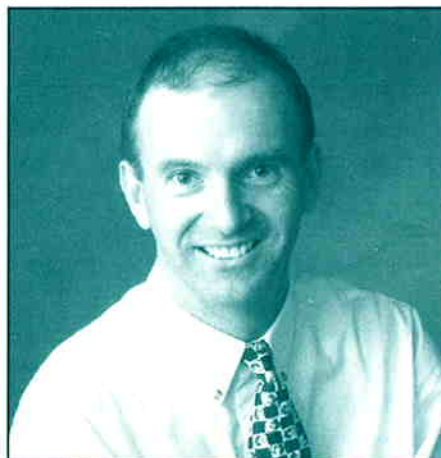
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From the new APEN President - John James

The challenge for us as an organisation of change management and communication specialists is to "walk the talk" ourselves. This was well demonstrated at Toowoomba during our international conference where we used the Open Space process for the first time at an APEN event to drive us towards our goals.

Similarly, when we focus on our network, we need to continue taking calculated risks and venture where we haven't gone before. One of the hot topics of conversation at Toowoomba was for APEN to get out of the "agricultural rut." The Indonesians refer to insular activities as being "like a frog beneath a coconut shell", where you have a limited perception of your universe. We have opportunities to interact with change management and communication specialists from health, transport and other areas. To involve them in our network would bring new understandings and improved perspectives... enriching and challenging us all.

As with most change, there may be some sacrifices involved to achieve the desired outcomes. The non-agricultural participants at our conference challenged us about the "E word" in our name, in that it is meaningless or, worse, confusing to their understanding of what we are on about. As we all know, it is sometimes better to change ourselves than try



to change those around us. For how many years have we been trying to better educate the people we work with about the true meaning of extension? Indeed, how many of us have grappled with our own understanding of what extension is and is not?

I relish the opportunity to lead our network into uncharted waters, using participative and consultative processes along the way. The **APEN National Executive** (see page 13) had a two day retreat at the beginning of December, where we pushed ourselves to explore beyond the boundaries. Over the coming months we will share with you our vision for the future. As Dr Lin, the conference keynote speaker said, "Choose your preferred future and plan to be there!" I look forward to a rich discussion as we embark on the journey together.

From the Editor

This issue is my last as editor. I have enjoyed my role over the past two years and thank all of you who have contributed articles and provided feedback to improve the standard of our newsletter. Your new editor will be Darren Schmidt who combines a background in journalism with his current role in extension for QDPI. I'm looking forward to reading future issues of ExtensionNet under Darren's editorial guidance.

The approach in this issue differs from my previous newsletters as the focus is on a

group rather than a theme. We have a number of very interesting groups who are dotted around Australia, New Zealand and the Pacific. Our intention is to profile the work that is carried out by teams of workers as a way of promoting the innovation that is occurring in extension. As you will find in these articles, often it is only when several projects come together in an overall program of extension that we grasp the interdependence between disciplines, approaches and people.

Season's Greetings.

Mark Paine

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This article describes the Product Development group's approach by outlining why getting change on farms to improve natural resource management outcomes can be difficult.

What this means is that when a farmer adopts an improved natural resource practice it will often be because of these other benefits, not just for an environmental improvement.

Untangling change

The Product Development Group, Department of Natural Resources and Environment, Tatura, Victoria

Introduction

Irrigated dairy and horticulture are the major users of northern Victoria's harvested water resources. Over the past 20 years the dairy and horticultural industries have made significant improvements in their irrigation practices and thus reduced their impact on the environment. The increasing importance placed on the environment by the general community, government and industry funding bodies however, is raising questions about the rate of change and whether the environmental improvements are satisfactory. With many options available for government and industry to facilitate change, communities and others are asking what are the best tools to accelerate change? The Product Development group within the Department of Natural Resources and Environment (NRE) uses a multidisciplinary approach to understand and demonstrate change in line with NRM objectives. The group uses a mix of disciplines, including technical research, economics, extension and marketing. These disciplines are sourced from within NRE or may be contracted from Universities and the private sector. Key stakeholders are engaged in developing strategies to achieve realistic outcomes for the local/regional context.

This article describes the Product Development group's approach by outlining why getting change on farms to improve natural resource management outcomes can be difficult. The rest of the article describes a range of available adoption mechanisms and discusses the importance of stakeholder involvement. Further articles in this newsletter deal with some of these issues in more depth.

Achieving natural resource outcomes isn't always easy.

Achieving on farm change for natural resource management outcomes is often very different to achieving changes that increase productivity. These differences need to be recognised and addressed.

Balance between public and private good

Improvements in natural resource management practices on farm often benefit the community (public good) more than the farmer (private good). This is because the benefits may be gained over a longer time frame than is relevant for the farm business or may occur at a different location. In order for farmers to change their natural resource management practices an overall private benefit must be evident. This benefit may be productivity increases, but could also include benefits such as labour savings, alignment with personal values or reduced risk.

What this means is that when a farmer adopts an improved natural resource practice it will often be because of these other benefits, not just for an environmental improvement. This has two consequences. The first is that potential environmental outcomes may not be achieved because farmers will be driven to maximise their private benefit (eg labour saving) and in the process compromise some environmental outcomes. Secondly, there is a need to understand the farmer's situation and identify when, how and if an overall private benefit can be achieved for adoption to occur.

Complexity

The changes required to improve natural resource management on any given farm can be complex. Often there is no one solution that will provide desirable outcomes at a catchment scale that will also provide farmers, who might be using unsustainable practices, with sufficient private benefits to act as incentives for change. In addition, investments to improve natural resource management are often complex and impact on a number of areas of the farm business. Simple, cheap, tactical options to substantially increase natural resource management are often not available.

Scale

Improved natural resource outcomes impact beyond the farm gate. Therefore, there needs to be consideration of the

outcomes needed at the farm, sub-catchment, industry and catchment scales. For example, to effectively reduce nutrients entering natural waterways, catchment scale recycling is required for rainfall events in addition to on-farm recycling. The methods of analysis, implementation and evaluation also vary considerably between these different scales. For example in program development, demographic information could be extremely useful at a catchment scale while an understanding of learning styles might be more relevant at the target group scale.

How can change be achieved - mechanisms

There are three broad types of mechanisms available to use in programs to achieve change. They are -

Voluntary – effective where a farmer has already identified that there is an overall benefit for them to change ie. the private benefit is sufficient. Common mechanisms to facilitate this change are incentives, provision of information, extension, research.

Compulsory – effective in creating an environment where adoption becomes preferable to non-adoption. Common mechanisms include audit and accreditation, preferential pricing, regulation.

Mixed – involves both compulsory and voluntary mechanisms. Market mechanisms are sometimes an example of these.

There is a cultural preference in Australia to first use voluntary mechanisms to achieve improved natural resource management before using compulsory or mixed mechanisms. As the balance between public and private good for many natural resource management issues favours public good there is usually a need to use a range of mechanisms that not only achieves positive environmental outcomes but that also minimises negative social impacts.

Multidisciplinary approach

Considering the issues involved in achieving natural resources management improvements, what is the approach of the Product Development Group? Broadly the work fits under four separate areas which when combined, we believe, heads us towards a more holistic approach to natural resource management project design and implementation.

• Stakeholder involvement

The Product Development group runs programs that assist stakeholders to work through NRM issues and develop strategies to achieve change. These issues are addressed at a local level and consider the biophysical, social and political context. Ongoing discussions are also held with funding bodies and other stakeholders on the outcomes that can be achieved given the unique balance between public and private benefit, project progress and the appropriate mix of change mechanisms that are required. This is important for many reasons but particularly because the outcomes achieved are more significant and sustainable over time.

• Organisational change

Natural resource management issues are complex and require broad input to achieve acceptable outcomes for all stakeholders. Such an integrated approach is often in contrast to the organisational culture and structure of public and private bodies. Therefore to achieve the required outcomes, organisational change is also required to support the project team to change much like the way we support farmers to change.

• Understanding the farmer

With the majority of natural resource management programs, achieving the outcomes requires changes in practices by farmers. It is therefore fundamental to the selection and implementation of a mix of change mechanisms to understand what factors will drive farmers to change their practices, what barriers will inhibit change, and what consequences of change will emerge socially, environmentally, economically and politically.

• Understanding change mechanisms

A wide range of mechanisms exist that can increase the rate of change on farm. These may be voluntary, compulsory or a mixture of both. Understanding what mechanisms are appropriate for the targeted group and the needs of stakeholders is important in terms of designing socially, environmentally and economically viable programs.

The following articles cover some of the projects in the Product Development group that are addressing parts of the approach described above. Feedback, comments or contrary views are welcomed and an important part of developing our discipline area and the APEN network!

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Increasing on-farm change: an argument for best practice relationships between researchers and service providers

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Chris Linehan, Katie Bowman & Daniel Armstrong

The issue

Pressure from the community and governments (stakeholders) for improved natural resource management (NRM), including improving water use efficiency (WUE), requires individual farmers to change practices and adopt technology for them to become environmentally accountable (Cocklin *et al.*, 2001). This is altering the focus and type of extension programs, away from programs focusing on direct farmer economic benefit towards programs delivering community benefit. However, the rate of on-farm change with regards to WUE across irrigated industries is lower than desired. Consequently a new approach to complement existing extension programs is being investigated.

There are rational reasons why farmers do not adopt changes addressing NRM issues, including improving WUE. These generally relate to the benefit cost ratio and complexity of the required changes in relation to individuals and their specific farm context. Commonly, addressing these issues with farmers requires a one-on-one or technical expert approach. Augmenting the Department of Natural Resources and Environment (NRE) services by collaborating with other

service providers to irrigated agriculture (specifically to the horticulture and dairy industries) may be needed to achieve the rate of on-farm change desired by stakeholders.

This article briefly outlines the rationale and approach being trialed at NRE Tatura to investigate and engage service providers relevant to water use efficiency in the irrigated dairy and stone and pome fruit industries in the Northern Irrigation Region (NIR) of Victoria.

Who are service providers and why might they increase the rate of change on farms?

Service providers are individuals or businesses who supply goods or services to a farmer, grower or producer. They may also be government funded such as extension staff involved in programs like Fruitcheque or Target 10. More commonly, service providers are thought of as individuals belonging to private organisations. Examples include Fruit Preserving Company / Milk Factory field staff, chemical and fertiliser resellers, feed merchants, seed/plant companies and consultants.

Bloome (1992) comments that farmers see information provided to them through alternative sources, such as service providers, as replacing more formal extension type services. In the Northern Irrigation Region (NIR), the level of dairy farmers utilising the dairy extension program Target 10 is between 10% (Integra, 1998) and 55% (The Virtual Consulting Group). If this trend is repeated in the stone and pome fruit industry, a large percentage of the farming community will not be directly involved in government extension projects.

Recent evaluation of viticulturists found that 74% are using service providers (Dunstone 2001). The same survey found 47% of the viticulturists were using company advisers as sources of viticultural information. The significant number of farmers not accessing government extension services, the wide range of information sources available,

combined with the often complex nature of NRM changes which require individualised advice, suggests that service providers may be in an ideal position to influence NRM change on farm.

How do we engage service providers? An approach.

To increase behavioural change on-farm through service providers, NRE needs to implement a management framework that identifies service providers whose businesses align with NRE's desired outcomes with respect to natural resource management. Such a process needs to:

- * understand the communication and adoption pathways that already exist between NRE research groups and service providers (internal and external to NRE),
- * identify best practice relationships between other organisations and their service providers;
- * use the above information to provide processes and tools that will enable NRE irrigated dairy and stone & pome fruit project groups and researchers to identify service providers relevant to their research objectives
- * engage service providers for a win-win result.

In 1999 Morgan Management Services was contracted to investigate the *"Relationships and information flow between dairy extension providers"* which asked how external service providers wanted to interact with NRE extension staff. Main findings included :

- * Existing relationships were "ad-hoc", with a heavy reliance on pre-existing relationships between individuals.
- * Service providers wanted NRE to develop more formal links with them.
- * Service providers thought that NRE under-utilised them, and did not respect their knowledge, skills and resources.
- * The need for better coordination and distribution of information from NRE research and extension.

Semi-structured interviews are currently being conducted with relevant service providers to obtain a greater insight into their businesses, perceptions of NRE and means by which they wish to interact with NRE.

Getting change within NRE

Morgan Management Services (1999), supported by Linehan (2001) also highlighted

that utilising service providers in an organised, formal and evaluated manner is not the way that some people in NRE "do business". This suggests that many people within NRE consider reducing interaction with non-government service providers is accepted organisational behaviour. Some individuals within the organisation value this behaviour consider it corporate culture (Mezias *et.al.* 2001; Lillrank *et al.* 2001). To change beliefs at an organisational level requires a managed change process as these beliefs are embedded in the actions of the organisation, for example in the routines, practices and skills base of the individuals (Mezias *et al.* 2001).

While we rarely expect farmers to change without some sort of plan and support or incentive, we often ignore such actions when expecting change from people within our organisations.

Various models exist which describe and define how and why organisational change occurs. Most propose a set of requirements that need to be met before change will be successful. Common elements to create change taken from models by Judson (1991) and Hussey (2000) can be summarised as:

- * identifying the need to change,
- * creating a shared vision,
- * ongoing and planned communication,
- * enabling and supporting change in behaviour,
- * implementation, and
- * consolidating or ensuring the change.

It is intended to use awareness of the anticipated benefits of researchers working with service providers to have research groups nominate to participate as a pilot group engaging service providers relevant to their current project. This selection method should reduce barriers to change allowing a more concentrated effort directed towards the change elements identified above.

It is anticipated that a range of tools will be tested using the Australian Business Excellence Framework's ADRI¹ cycle to govern the process that will have researchers engage service providers. It is planned that such an approach will produce a repeatable, documented and improvable process that other groups can utilise into the future. Guidelines such as the International Customer Service Standard (Customer Service Institute of Australia 1999) will provide a

definition and methodology for engaging service providers based on interview findings.

Future work?

It is hoped that future work will centre more comprehensively on understanding organisational culture and its impact on projects relating to natural resource management in Victoria.

1 Approach, Deploy, Results, Improve (Australian Quality Council 2001)

References: Contact APEN Secretariat for a copy.

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A farm management economics approach to extension - water use efficiency on irrigated dairy farms in northern Victoria and southern NSW

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Introduction

In northern Victoria and southern New South Wales (NSW), efficient use of irrigation water is important to the future of the dairy industry. Limitations on the availability of irrigation water and environmental issues have resulted in increased pressure to improve water use efficiency (WUE). Water use efficiency is defined as the amount of milk produced from pasture per ML of water applied by irrigation plus effective rainfall.

While improving farming practices may be necessary to maintain the regions natural resources, farmers need to balance this industry and community imperative with their individual objectives. Ensuring that adoption of information on sustainability issues makes individual farmers better off is an important aspect of being a responsible provider of information.

A large random survey of irrigated dairy farms in northern Victoria and southern NSW (Armstrong *et al.* 1998, 2000) found a four-fold range in WUE, indicating potential for many farms to substantially improve WUE. Effective irrigation, pasture, grazing and feeding management were the key factors associated with high WUE. Extension activities based on the survey information were effective in creating awareness, but did not result in widespread change (Bowman 2000). Industry benchmarking surveys can be effective in indicating potential for improvement in areas of the farm business (Queensland DPI 1983), but are unlikely to result in widespread changes in practices and may not be an appropriate tool for making farm management decisions (Malcolm and Ferris 1999). Farm management decision-making is about deciding on the most effective use of resources on a farm to achieve the objectives of the business in the future and needs to consider the complex combination of human, production, environmental, economic, and financial components of the business (Makeham and Malcolm 1993). To understand the complexity of decision making processes, in-depth ex-

amination of a small number of businesses is generally more beneficial than surveying a large random sample (Sterns *et al.* 1998).

This article describes an approach using farm management economics to investigate options for increasing WUE on a case study farm. The purpose was to examine if this extension approach could result in increased WUE, increased profitability, and be compatible with a farmer's objectives. Economic and human/social issues are considered, as well as the environmental and production issues, to gain an improved understanding of the decision-making process and motivation for change.

Methods

Farm selection

The case study farm was selected because changes had been implemented in recent seasons that had affected WUE and profitability, and possible further changes were being considered. This enabled investigation of links between WUE and profitability, and provided opportunities to obtain insights into other motivations for improving WUE.

Data collection and analysis

Production, economic and financial data were collected by personal interview for the 1995/96, 1996/97, 1997/98 and 1998/99 seasons. The factors that may have contributed to changes in WUE and profit over the four seasons were discussed. The medium to longer-term plans and options for the farm, and the main constraints, were scoped through a semi-structured discussion.

The production efficiency calculations used have been documented by Armstrong *et al.* (1998, 2000). Farm management economics budgets were developed according to Makeham and Malcolm (1993).

Evaluation of development options

Four initial development options were evaluated, based on the comprehensive information collected, by estimating the whole farm operat-

ing profit, in the steady state, after implementation. After considering the operating profit and practicalities of four options, two options were discarded. Ten-year discounted net cash flow partial budgets (here in after referred to as development budgets) were completed for the remaining options, which were used to investigate the return from investing in these options and the feasibility of financing the development. These development budgets were the appropriate method to examine how the existing farm could be developed to improve WUE and profitability in the future (Malcolm and Ferris 1999). The 10-year period allowed the returns from the investment to be expressed and was consistent with the planning period of the farmer. Details of the assumptions used in constructing the development budgets can be found in Armstrong (2001). An analysis of the sensitivity of the different options to fluctuations in key parameters, such as, milk price, was also conducted.

Results

Background to the case study farm

The current owner operators (a father and son full time plus some assistance from the mother) purchased the farm approximately 15 years ago. They plan gradual development into the future. The father wants to hand over the management of the farm to the son over the next 5-10 years.

The milk harvesting facilities are the main constraint to increasing herd size, and hence milk production. By building a new dairy, the owners anticipate a large enough reduction in milking time to allow them to milk an extra 70 cows without any extra labour. The owners considered replacing, or renovating, the dairy to be a necessary component of any expansion option.

The relatively low irrigation water right per hectare of this property means there will be an irrigation water shortfall in most seasons, if the current area is fully irrigated. While reliance on temporary irrigation water makes the farm vulnerable to price fluctuations between seasons, the owners seem comfortable with this vulnerability. Purchasing permanent water right would increase the total liability of the farm and make financing development options more difficult, as the equity of the farm business is currently relatively low (approximately 55 %).

There is about 20 hectares of non-irrigated



Group looking at pasture from field day

land that could be developed for irrigation. Opportunities to purchase adjoining pieces of land may arise, but most land in the immediate vicinity of this farm also has a low water right per hectare.

There was not a simple, direct relationship between WUE and operating profit on this farm. However, the season with the lowest WUE also had the lowest operating profit (1997/98), and the increase in WUE in 1998/99 coincided with an increase in operating profit. While WUE is not always the major factor impacting on operating profit, increases in WUE can be profitable.

Potential areas for increasing WUE and profitability

Increases in WUE can probably be achieved through continued improvements in grazing management, which may lead to increased income and/or reduced feed costs. Observations of post grazing mass by the farmer, and others, indicated considerable scope to utilise more of the pasture grown. This suggests that reducing supplementary feeding, or increasing stocking rate, is likely to lead to higher pasture consumption and higher WUE.

There appears to be potential to increase profitability by investing in infrastructure that increases labour efficiency. For example, a new dairy would allow milk production and income to be increased with similar labour requirements.

The irrigation water use does not indicate significant potential to increase WUE through improved irrigation application efficiency. Alternatives to flood irrigation, such as sprinklers, are unlikely to reduce water use on this farm as the soil type is a heavy clay (Wood and Martin

2000) and the irrigation layout appears efficient.

Some initial options were proposed that met the objectives of the farm owners, and provided opportunities to capitalise on potential for improvement in profitability and/or WUE. However, the practicality and economic feasibility of these options needed to be considered thoroughly.

Evaluation of the development options

The process we used to deal with the complex farm management decisions associated with the development options was developed and refined through discussions with a farm consultant (Ian Gibb, Farmanco) and other advisers, and is summarised in Table 1.

The projected whole farm operating profit of each of the four options, in the steady state after implementation, was higher than any of the previous four seasons (Armstrong 2001). After considering the operating profit and practicalities of implementing the four options, two options were discarded. However, the discarded options may be quite appropriate in a different situation on another farm. The remaining two options were (i) develop land for irrigation, or (ii) intensify on the existing land. Both options involved constructing a new dairy. While the whole farm profitability of the two

options appeared reasonable, in the steady state after implementation, it is also important to consider the return from investing in these options and the feasibility of financing the development. Hence, 10-year development budgets were completed.

The development budgets suggested that intensifying on the existing land is the most attractive option. The IRR was high and the peak debt appeared manageable. Vulnerability to fluctuations in prices and the predicted gains in WUE were low. This option appears to be compatible with the objectives of the farm owners and was likely to result in increased WUE and profitability. The owners have commenced implementing this option in a slightly more gradual manner, which is congruent with their attitude to risk.

The main reason for not implementing the option of developing more land for irrigation is that it would substantially increase debt. However, this option may be considered in the future if equity increases.

Process for dealing with a complex farm management decision.

Stage 1. Identification of the issue/problem.

1.1. Collect background information on resources, constraints, plans, goals.

1.2. Initial analysis (e.g. stocking rate, WUE).

1.3. Comparison of results from 1.2 with benchmarks and standards.

1.4. Interpretation of results from 1.1, 1.2 & 1.3 to identify key issues, con-

straints, and potential to increase profitability and efficiency.

Stage 2. Quantitatively predict the potential improvements identified in Stage 1. (Initially conduct Stages 2 & 3 roughly to eliminate some options, and then analyse remaining options in more detail).

Stage 3. Farm management economics budgets. Examine financial feasibility and profitability of making changes and test sensitivity.

Stage 4. Choose an option. Generally not a stage where an adviser has much input.

Stage 5. Plan implementation. Set measurable targets that can be worked towards.

Stage 6. Implement.

Stage 7. Review. Not crucial, but good for measuring progress and learning for future decisions.

Conclusion

The approach of assessing the current situation on the farm, identifying areas where potential to improve may exist, and then evaluating development options, appears to be appropriate for WUE extension in the irrigated dairy industry. An integral part of this extension approach and of farm management economics is understanding the goals and aspirations of the farmer. The budgets act as a tool to inform the decision making process and take the discussion to a higher level, rather than providing a definitive answer.

The case study farm data indicates there was no simple, direct association between WUE and profitability. However, economic analysis of development options for this farm found that there were some options that were compatible with the objectives of the farm owners and were likely to result in both increased WUE, and increased profit. Options that simultaneously result in increases in WUE, profitability and labour efficiency appear to be more likely to be adopted than options that focus solely on increasing WUE.

An investment in improving WUE is often complex and generally impacts on a number of areas of the farm business. The complexity of increasing WUE suggests that the individual situation of the farm needs to be considered before providing advice.

References: See APEN Secretariat for a copy

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Understanding the farmer - Identifying drivers for change

In the past the art of extension was viewed as the adoption of innovations that were based on relaying the latest results from scientific studies to the farming community. This not only assumed that the innovation was beneficial to the farmer and his direct farming context but it also assumed that the farmer actually wanted to change.

Adoption of a new practice or piece of technology requires behavioural change in the end user, in this case the farmer. To get adoption of an innovation the farmer must be (or must be induced into) discontent about his current situation. This is particularly worth understanding when trying to achieve natural resource outcomes. The model below (Integra 1998) is a simple change model that allows explanation of factors required in order for adoption to occur.

DISCONTENT x VISION x PLAN x CAPABILITY >>> CHANGE RESISTANCE

- * **Discontent** – unhappy with their present situation,
- * **Vision** – have a shared vision – know what things could be like,
- * **Plan** – know what action to take – have a plan of what to do
- * **Capability** – the capacity, skills and resources to implement the plan and
- * **Change resistance** – this all has to be greater than their personal feelings towards avoiding change or the effort to overcome any barriers.

An adoption (implementation) pathway is a model that encourages change to occur by recognising the key factors that drive change, removing impediments and supports the process. An adoption pathway can be defined as a logical process that needs to be followed in order for the uptake of the new technology to occur at farm level.

Technical research and extension commonly provides a vision of what is possible (eg best management practices or research results), what action to take (eg Decision Support Systems, extension programs) and supports the capacity of the farm community to act (eg field days, incentives). Levels of discontent and resistance

to change are factors determined by the farm context (eg life style, irrigation system), personal attributes of the farmer (eg attitude to risk, values, knowledge) and the external environment (eg water policy, input costs). The level of discontent is particularly useful to investigate, as it is this factor which will provide the insight into which groups of farmers actually want to change their current practices. This can then support the identification of the change mechanisms and adoption pathways with the greatest potential to result in change.

As previously mentioned, the level of discontent (and hence drive to change) is influenced by factors both within the farm gate and factors external to the farm. To achieve change where there is discontent (either existing or externally influenced) a plan, vision and, capacity to act that is greater than the resistance to change must be provided.

Discontent

Discontent describes a level of dissatisfaction a farmer has with the current farm situation or environmental field. Farmers adopt practices to solve problems or satisfy needs. The adoption of a new farming practice usually a high involvement issue for farmers (Kaine and Bewsell 2000) and tends to be characterised by active learning and product evaluation over a substantial amount of time. This in turn implies that the decision not to adopt a new practice will also be based on a reasoned argument.

The factors external to the farm, which are usually outside the control of the farmer include, government policy, community values, regulation and market drivers. Governments and industry have used external drivers to create discontent and

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drive change in a way that has been described as 'top down' (Monash *et al.* 2001). Where there is no discontent the farmer will usually



Modified centrepivot irrigator

demonstrate apathy or disinterest towards the topic or issue.

Vision

For farmers to adopt a new practice they need an understanding of their current situation, what improvements are possible, and how these improvements will meet their needs, in other words they need to know the private benefit in changing their current practice. This gives their actions a clear purpose, boundaries and a target. Without a vision farmers may quickly take action but soon feel confused and frustrated. Best management practice and benchmarking projects provide a description of what is being achieved by the current farming systems and practitioners. Research plays an important role in describing what is technically possible not only with the current

system, but also with new or modified systems.

Plan

In order to achieve change farmers need clear steps to alter their current practices in accordance with their personal vision. This commonly means that there needs to be a range of options available. The 'crop check' programs, farm economics and advice from private providers are commonly aimed at giving the steps required for adoption. Where no plan is available the farmer will usually display a high level of frustration and information seeking behaviour.

Capacity

Farmers must be able to implement their plan. The capacity of a farmer to adopt is influenced by his/her personal capacity as well as the time, resources and finances that are available. Training programs for example are often used to increase a farmers personal capacity while incentives are used in an attempt to assist with financial capacity. There are other factors that affect the capacity of farmers to change. The most important one is the outside influences imposed on the farmer such as regional infrastructure or regulations.

Resistance to Change or Barriers to Adoption

In order for change to occur all of the above conditions must not only be met but must be greater than the farmers resistance to change or the barriers to adoption. There are many cases where farmers are discontented about their current situation, know what they could achieve and have the capacity to change, but are still reluctant to change. This may be for many reasons related to their environmental field, such as the compatibility of the change with personal values, the relative advantage of the change, community norms, attitude to risk or trust in the reliability of the information provider.



Improved flood irrigation layout

Is a change framework useful?

The use of the simple change framework in program design has been useful in a number of respects. The framework makes sense to the broad range of stakeholders interested in improving WUE and they can relate it to their own personal and business experiences. The framework has been able to explain a number of important concepts. The key ones being – a number of factors influence whether change will occur; a range of approaches are required and each part of the change process needs to align and integrate with the others.

The framework has enabled the stakeholders to 'untangle' the change process and identify potential gaps. It has also legitimised the role of, perhaps, less traditional issues such as values and community norms in the change process.

The future use of the framework will continue to be modified as results from the review of the packages and of the overall approach. The ultimate success will be measured in the improvement in WUE by the dairy industry.

References: Contact APEN Secretariat for a copy

The 'crop check' programs, farm economics and advice from private providers are commonly aimed at giving the steps required for adoption. Where no plan is available the farmer will usually display a high level of frustration and information seeking behaviour.

The framework has enabled the stakeholders to 'untangle' the change process and identify potential gaps. It has also legitimised the role of, perhaps, less traditional issues such as values and community norms in the change process.

A reminder: All those who haven't paid their subscription for 2001/2002 please do as soon as possible!

Increasing on farm change: external drivers – understanding how policy mechanisms can accelerate change on farm.

Demand for irrigation water in northern Victoria is dominated by the pasture based dairy industry which uses over half of all the irrigation water in the region. There are many positive signs for the industry's future in northern Victoria where irrigation water underpins its success now and into the future. Effective management of natural resources is essential to the irrigated dairy industry. Efficient water use is perceived by many as being part of the strategy to meet natural resource management (NRM) objectives.

There are a range of programs (ie. extension, research, incentives) used to encourage improvements in water use efficiency (WUE) at the farm level. Research shows there have been significant improvements in WUE on individual farms and by the industry. However there is increased pressure for more improvements in WUE across the dairy industry. To meet these requirements additional complementary mechanisms may be needed to drive the desired levels of change on farm.

The right mix – getting change on farm

Changes in WUE on farm are currently voluntary with farmers choosing or being

encouraged to adopt practices through incentive based initiatives and extension programs. Research suggests that the easy improvements have been made and that only a minority of farmers are now likely to adopt improved water use practices in the short term, for reasons relative to their own context (Linehan 2001). Pressure for increased improvement in WUE to address NRM objectives presents new challenges, and has implications for designing NRM programs. Understanding the various mechanisms that encourage and support change and their impact at the farm level will be an important tool in achieving desired NRM objectives. Policy mechanisms are not a new concept, and can be grouped into three types:

- ® **Voluntary** eg. extension programs, education & training, research
- ® **Regulatory** eg. environmental management systems
- ® **Mixed** eg. incentive programs supported by extension, compulsory training programs to access water

Often having a 'mix' of mechanisms increases the likelihood of successfully

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achieving change outcomes as they target farmer groups at different levels. Given that research shows that most of the gains in WUE using voluntary mechanisms have been made in the current environment (Brown 2000), it is appropriate to review the mix of mechanisms designed to achieve WUE, and to investigate new options to drive change at the farm level.

How do we understand the best mechanisms to support change on farm?

A useful framework for identifying and implementing a mix of mechanisms is the Bridgeman and Davis' policy cycle (figure 1). The cycle is iterative but recommends that programs start by clarifying the nature of the issue across the various stakeholders. Using a

Policy Cycle Framework



Kevin at field day

WUE example we may find that some stakeholders are seeking increases in productivity from the water they use, while other stakeholders may want improvements in natural resource management practices.

This clarification is very important because the stakeholders will determine the ultimate solution through their participation. An understanding of existing mechanisms and their impact on achieving change provides a basis for identifying additional mechanisms. An important factor in determining successful change is the capacity for individuals (in this case farmers), to respond to the intervention/mechanism. Understanding the full impact of mechanisms prior to their introduction reduces the risk of unintended negative consequences arising at the farm level. There are five analytical indicators that should be used to fully understand the impact of any mechanism:

1. Economic
2. Social
3. Environmental
4. Legal
5. Political

Understanding the nature of the issue in this context can reduce the risk of negative impacts and strategies that don't deliver on outcomes. This framework will provide a scenario analysis that can help stakeholders direct the best mix of support for change on farm. It will provide direction for new mechanisms, and support the existing mechanisms like research and extension.

APEN 2001 International Conference

Contemporary extension as a powerful vehicle for regional change,
University of Southern Queensland, Toowoomba, Queensland, Australia.

The 3rd APEN international conference was held at the University of Southern Queensland in Toowoomba, Queensland during 3-5 October 2001. Conference convenor, John James, said there were almost 250 participants from seven countries. The first day consisted of 36 presented papers and the second and third days were Open Space sessions.

John explained that "evaluation of the conference consisted of a feedback form at the end of the first day and another at the conclusion of the conference, daily snapshots to monitor the mood of the conference, chairpersons' reports of the presentations and hot topics generated from the Open Space sessions."

The daily snapshots showed the conference peaked during day two in enthusiasm and enjoyment (3.9 /5), interaction and networking (4.1 /5), and information exchange (3.4 /5). There was a drop of enthusiasm and enjoyment on the last day (2.6 /5).

The feedback from day one showed a great appreciation for the keynote speaker (Ian Lin), receiving the average rating of 7.8 /9 and many mentions in the highlights of the day. Anecdotal evidence indicates that many presenters referred to items from the keynote address in their own presentations.

The Open Space sessions were given an average rating of 6.6 out of 9. The registrants on average suggested approximately equal time of presentations and Open Space for future APEN conferences.

John was excited by that there were five 'hot topics' generated from the Open Space sessions, which give an indication to potential future action to arise from the conference. These were:

- * Better understanding, use and development of theory relevant to extension
- * Towards a National Extension Framework
- * Getting out of the agricultural rut
- * Professional development for change agents; novices and community facilitators
- * Extension as a Business – Communicating our success

These will be reported upon in future issues of ExtensionNet. The full conference report is available on the website at www.apen.org.au.

Copies of the APEN 2001 Proceedings and the Conference Folder are available from the APEN Secretariat.

The Proceedings has copies of the keynote address by Dr Ian Lin and the 36 refereed papers presented at the conference. Included in the Conference Folder are the remaining 40 papers that were submitted as well as the 55 topics discussed in the Open Space sessions - "the state of the art of extension in 2001".

Cost for both (including GST and postage in Australia): Members – \$49.50, Non-members – \$65.50

Contact Rosemary Currie on 02 6024 5349 or send an e-mail to rcurrie@albury.net.au with your request, including name, address and an invoice will be sent with the Proceedings and Folder. Payment by cheque, Visa, Mastercard, Bankcard and American Express.

From the APEN 2001 AGM

Thirty four APEN members were present at the APEN 2001 AGM held on October 5 at the University of Southern Queensland. The meeting was opened by the President, Jane Fisher and after the President's and Treasurer's reports were accepted by the meeting she invited the retiring Vice President, John McKenzie to take the chair for the elections. In APEN, terms of office are two years and those positions up for re-election were the President, Vice President, Secretary and two committee members.

All nominations were elected unopposed and the new committee is:

President: John James SE Queensland

Vice President: Amanda Miller Western Australia

Secretary: Heather Shaw Western Victoria

Treasurer: Greg Cock South Australia

Editor: Mark Paine Melbourne

Committee: Jon Warren Western Australia; Paul Ainsworth Murray Riverina
Terry Reid SE Queensland; Janet Reid New Zealand
Jane Weatherley Tasmania

John declared all the above people duly elected and invited John James to take over the meeting as the new President with Amanda Miller as Vice President. John and Amanda accepted the invitation. John James took the Chair. He thanked Jane for her work as President over the last two years and said he looked forward to working with all the committee and members of APEN

As forwarned in the notice of AGM, three motions were presented to the meeting:

1. Motion to Increase the Ordinary Subscription Rate by \$10 to take effect from July 2002. There was a feeling that membership subscriptions need to be kept as low as possible to encourage people to remain as members or for new members to join. The concern was expressed that if there is a rise that there should also be an increase in benefits to APEN members. Members were reassured that there were a number of items listed in the Strategic Plan developed in 2001 that covered increased benefits to members. Members were asked to visit the APEN Website and give comment to the committee about the plan.

The motion was put: That APEN ordinary membership subscription be increased to \$A65 (including GST). Moved: Greg Cock, Seconded: Jane Fisher Votes: 32 for the motion, 1 against **Carried.**

2. Motion that those who have not paid subscriptions for two years be dropped from the membership database. Greg explained that this would mean that if members un-financial (owing for the last financial year and the present financial year) as at November, that they would get sent a reminder and if un-financial by December 31st would then be deleted from the database. This is mooted not primarily as a punishment, but simply because it costs APEN to keep chasing people and the continue to provide ExtensionNet and other things to members

The motion was put: That those who have not paid subscriptions for two years be dropped from the membership database. Moved: Greg Cock Seconded: Tony Dunn 1 against **Carried**

3. Motion that members who join between January 1st and June 30th pay half membership + \$10 (secretariat overhead). Greg explained that this change was proposed as an encouragement for new members and would be done by the Secretariat but not actually on membership application forms – it could be mentioned in the letter of welcome to members joining during that time.

The motion was put: That members who join between January 1st and June 30th pay half membership + \$10 (secretariat overhead) for that financial year. Moved: Greg Cock Seconded: Tony Dunn **Carried**

FROM THE CHAPTERS

Horticulture Australia Funded Recycled Water Tour to Israel and California 2001 - VG00087 – Final Report Published

Between 22nd April and 4th May 2001, 25 participants visited Israel and California on a study tour of reclaimed water use, new reclaimed water technology and alternate crops and farming systems. The tour was led by Jim Kelly, Craig Feutrill and Daryl Stevens and was accompanied by three ABC staff to produce segments for the ABC's Landline program and other industry promotion videos.

The primary purposes of the study tour were to:

- 1. Observe and discuss technology first hand that might be appropriate for adoption by the Australian reclaimed water industry to improve their businesses;*
- 2. Improve the understanding of overseas R&D and its relevance, encouraging growers to be more active in prioritising research in Australia;*
- 3. Establish and promote linkages between Australian growers and overseas industry members and researchers;*
- 4. Increase grower's knowledge base and understanding so as to reduce the inhibition to the use of reclaimed water and to promote further the demand for use of reclaimed water; and*
- 5. Increase public perception of the benefits and safety of using reclaimed water in agricultural production.*

Communication of the findings from this study tour has been at several levels. The general public have been educated through three Landline articles on ABC TV. The horticultural industry has been educated through release of industry-based videos, presentations by the Tour leaders around Australia (on-going) and through direct communication between growers that participated in the tour and others. Finally, the water industry has been educated by several industry reports/presentations to state water treatment authorities.

For more information contact South Australian Vegetable Industry Development Officer, Craig Feutrill on 0418 831 089.

Meet the 2001/2002



John James is the new President of APEN. He has been on the National Executive for two years, has organised the development of the APEN listserv and new website as well as being the convenor of the APEN 2001 International Conference in Toowoomba. John plans to achieve lots in his term as President.

John is the Training Coordinator and Acting Director at the REC in Queensland. His undergraduate studies were in horticultural science. Upon graduating, he became the industry development officer for nursery crops in Queensland, working with the DPI. He has since completed his Masters, focusing on adult learning and business management. This is now his third year with the REC where he enjoys applying his knowledge and helping people improve their capacity. As John says, he has moved from "growing plants to growing people".



Originally from Ipswich in Queensland **Amanda Miller** is a graduate of the University of Queensland (Gatton Campus). She completed a Bachelor of Applied Science (Rural Technology) which is a 4 year degree and graduated in 1990. Her specialist areas are weed science, plant pathology, entomology and pesticide application technology.

After spending five years in the cotton, broadacre and extensive grazing systems of the Moree and Armidale areas of NSW, she is into her eighth year with the Western Australia Department of Agriculture. She has spent two years in Lake Grace, four years in Northam and the last two years in Lake Grace. The "Time to Lime" extension project has been her focus for the last six years, a project that will end in its current form in June 2002. After June she will be

focusing on district specific extension projects in farming systems.

Amanda has been an APEN member for nearly five years, the WA Chapter president for 3 years and is the newly elected APEN National Vice President.

She has been a keen cricketer over the years representing QLD six times and making two national development squads she has played for Melville and North Lake Grace in WA as well as Cripple Creek in the Moree Association and the University of Queensland in the Brisbane competition. Her spare time is spent in the garden or reading forensic crime novels.



Heather Shaw works for the Department of Natural Resources and Environment (NRE) in Victoria, managing a project called 'Developing Social Capability'. She is an agricultural science graduate, and also spent time at UWS Hawkesbury in the mid 1990s, gaining my Master of Applied Science.

Heather's background is in pasture agronomy, working as an extension practitioner in the Salinity program and then the Landcare program in Victoria for almost 10 years. After Hawkesbury her desire to influence change lead me to a four and half year stint in the purchasing arm of NRE where she attempted to influence decision-making processes for investment in agricultural research and extension.

Heather's passion lies in evaluation, critical thinking and learning, and Developing Social Capability is her attempt to encourage more extension practitioners to incorporate these disciplines into our practice. That's also why she has been a member of APEN for almost as long as it's been around. She sees it as a fantastic opportunity to network and to share learning with professionals locally as well as from other parts of the country and other fields. As a recently elected member to the National Executive, Heather hopes to contribute to the diversification of the organisation and to providing a wider range of opportunities for the professional development of members. She would also like to see extension raised to its rightful place amongst other professions, by highlighting the existence of extension/change management theory.



Greg Cock is the current Treasurer of the APEN National Executive. He is working with Primary Industries and Resources SA, in the Rural Communities and Education Program within the Sustainable Resources Group. The majority of his current work is in a policy and purchasing function of the FarmBis Program, having spent the past several years working within the Property Management Planning Program. During 2000/2001 Greg worked with Rural Directions Pty Ltd, on a contract with AFFA as the National Coordinator of the PMP Campaign.

His background goes back to being in extension in land management, being a soil scientist by label. For some years he worked out of a multi-disciplinary, multi agency facility during the early days of the push toward a more integrated approach to natural resources management in SA. Way way back Greg ran research projects on soil and water management in irrigation areas along the Murray and published several papers on that work.

His interests now are in pursuing the more enlightened approaches to extension and interaction with farmers. Being some what wary of technical gurus, technology transferrers and advisors, in recent years, the articulation of capacity building ideas, facilitated approaches and the focus on communities has been a breath of fresh air. That APEN is also pursuing these directions is a major motivation to be involved in APEN.

Darren Schmidt, APEN's new Editor, (see next photograph) has been an Information Extension Officer, working with field crops, with the Qld Department of Primary Industries since 1996. In this role, he has called upon a wide range of skills – writing, editing, desktop publishing, event management, media relations, marketing and team building – to bring information to crop farmers in northern Australia and promote the importance of field crops in the Australian economy to the urban public.

Darren is trained as a journalist but, after graduating, decided to pursue further degrees and undertook a Masters in communication management. He has a

APEN National Executive



been on the National Executive for the past two years. He has maintained his interest in APEN because he believes it has an important role to play in ensuring opportunities for national and international networking as well as setting the standards for professional development in our field. He is also a person who believes that if you want to get a little you need to give a little and hopes that the little he can give to APEN will contribute to it becoming a dynamic body meeting the needs of its members.

continuing interest in communication and information theory and practice and one day hopes to return to academia to resume teaching and possibly embark on some community-level research projects. He is currently pursuing another Masters degree (Agricultural Systems) part time. He is also keenly interested in futures studies and is a member of the World Futures Studies Federation (WFSF).

Darren's non-professional interests revolve around travel and music. He's an avid bushwalker and amateur naturalist and most weekends see him playing guitar in a blues band or spending time with wife Roseann and toddler son Oscar.



Paul Ainsworth has been a member of the APEN National Executive since the 2000 AGM. Paul started his career with the Victorian Department of Natural Resources and Environment in 1995 after completing a degree in Social Science, which focused on Environmental Policy. During his time with DNRE Paul worked mainly in the grains industry focusing on group facilitation, project design and evaluation and strategic planning. Some of Paul's key achievements whilst with DNRE was the benchmarking of Best Chemical Practice in the Victorian Grains Industry, qualitative evaluations of the Victorian TopCrop program, facilitating strategic planning workshops as part of the Farm\$mart program and conducting staff training in relation to extension principles and practices.

In August this year Paul accepted a position with National Foods Ltd as Farm Services Officer. In this role Paul works closely with Victorian and South Australian dairy farmers with a focus on quality and volume objectives. Paul lives in Tatura and believes APEN has a critical role in both private and public organisations to examine how change can facilitate and contribute to the development of rural communities and their resource base.

In the days when Government funded an agricultural extension service in NZ, **Janet Reid** (see next photo) began her career as a farm advisor with the, then, Ministry of Agriculture and Fisheries in Southland. The big OE led to a range of experiences including work in the field of animal embryo collection and transfer.

He has been a member of APEN for so long he cannot remember just how long and has



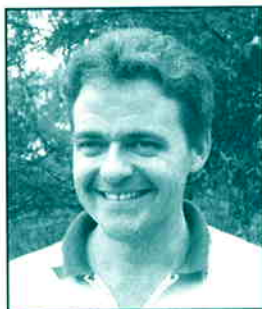
Janet came back to New Zealand and Massey University close to 10 years ago. Since that time she has been involved in research and teaching that focuses (in the broadest sense) on the linkages between science providers, farmers and growers, the changing role of agricultural extension and consultancy in NZ and processes to facilitate change at the farm, community and industry level. Recently, she has undertaken consultancy projects in NZ and overseas that involve the use of, and training in participatory approaches to extension, community consultation and resource management and has a strong interest in the application of systems thinking in her work and teaching.

Although it is a somewhat different environment for agricultural extension in New Zealand, the linkages, and sharing of ideas and energy that comes from an involvement with APEN has been invaluable. Janet is a new comer to the APEN National Executive and is looking forward to developing this role and seeking opportunities for raising the profile of APEN in New Zealand.



Jane Weatherley is currently a postgraduate student doing a PhD, based at the University of Tasmania. Her research interest are focused on the requirements and possibilities for learning and change, in the context of Australian dairy farming systems research and extension. Jane also works on the Tasmanian Sustainable Grazing Systems program as an Executive Officer. Before her life as a PhD student, she worked as a research assistant on projects at the University of Tasmania which focused on animal nutrition and extension research and evaluation. She joined APEN three years ago and is one of the new members to the National Executive.

Meet the 2001/2002 APEN National Executive Continued



With experience in process design, group facilitation, strategic thinking, project management, and land management extension, **Terry Reid** is currently working with the Queensland Department of Primary Industries based at Ipswich near Brisbane.

As an Extension Officer his focus is to help farm families better able to secure their future and achieve their personal and business goals by adopting an integrated planning approach to their management.

Recent changes in government policy and investment initiatives has challenged Terry, like many other people, to face the reality of a changing work environment and put into practice a few more of the skills he encourages his clients to adopt. Such as skills needed to deal with unchosen change, turning challenges into opportunities, and clearly defining expectations and needs of all stakeholders . . . including his own expectations and needs, such as spending lots of time with his life partner, Sandra, and their two year old daughter Emily.

Terry believes being passionate about what he spends time on helps him remain optimistic, as does seeking out and working with people around him who are passionate. Like all things, this is not always easy to do, which is why he is a member of APEN and joined the National

Executive last year, to network with passionate people focussed on making a difference in regional communities by achieving results in a professional way.

Terry enjoyed the interaction and discussions at the conference in Toowoomba and is looking forward to participating in future APEN activities, especially over the next few months through his local chapter.

Now that you have met the National Executive - they would love to hear from you by telephone or E-mail with any comments or suggestions to make APEN the organisation you would like it to be. Their contact details are listed below.

APEN WEBSITE

[http://
www.apen.org.au](http://www.apen.org.au)

APEN MEMBERSHIP

510 members at end November 2001
 370 are Financial
 90 owe for 2001/2002
 50 owe for 2000/2001 & 2001/2002

Opinions expressed in ExtensionNet are not necessarily those of the Australasia Pacific Extension Network (Inc.) unless otherwise stated.

Guidelines and deadlines

Submissions should be made in Word with minimal formatting. A portrait photograph is required. All photographs, figures and/or tables ought to be provided as separate files (preferably TIF, GRIF or JPEG). Feature articles ought to be 1500 words and minor articles 750 words. Letters to the editor or general items of news of interest to the network are welcome. Articles should be submitted to the committee four weeks prior to publication. Preference is given to articles that are grounded in some form of project or event.

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