Ministry for Primary Industries
Manatū Ahu Matua

# OVER THE FENCE

## Designing extension programmes to bring about practice change

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New Zealand Government

# **OVER THE FENCE:** Designing extension programmes to bring about practice change

## THE CONTEXT

This handbook was developed to assist people who are already implementing a Sustainable Farming Fund (SFF) project or plan to apply for SFF support, as well as people who have an idea, technology or information they want to share and be adopted by others. Administered by the Ministry for Primary Industries (MPI), the SFF invests in applied research and projects led by farmers, growers, or foresters.

Specifically, this handbook can be used to help develop and deliver an extension programme. This handbook will help you think about how to develop an effective programme that will assist participants in understanding new or changed practices, accessing information or resources, and changing their practice or behaviour if required.

In this handbook, the term "adoption" is used to encompass the many terms that can be used – technology transfer, adaptation, extension, research use and uptake, knowledge brokering or co-innovation.

## THE WHAT

This handbook has been developed to help you develop an extension programme that encourages thoughtful discussion and consideration of other options.

The handbook is not intended to provide only recipes and quick results. Throughout the handbook we have tried to provide practical and relevant guidance, shaped by our own experiences and knowledge of a range of successful extension programmes. A variety of tips, ideas and practical examples are included which will add to your own repertoire of experiences and learning.

## THE WHY

All too often there are a set of assumptions about how to design extension programmes. Typically these will include meeting the milestones and KPIs of the funder, and then delivering workshops, field days, producing hand-outs and delivering presentations to end users, such as foresters, farmers, agribusiness representatives, and consultants. Successful extension programmes, however, are much more. They involve planning and ongoing monitoring and refinement throughout the programme, and effectively responding to unexpected issues and outcomes that arise.

The advantages that a highly effective extension programme can create include:

- more rapid understanding of benefits;
- higher level of engagement and willingness to change;
- a greater proportion of target group changing behaviour;
- faster rate of adoption and behaviour change;
- higher level of successful implementation; and
- increased credibility for all involved in the programme.

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## UNDERSTANDING AND ENHANCING WHAT PEOPLE DO AND WHY THEY MIGHT CHANGE

The primary sector faces some interesting challenges. How does the primary sector continue to evolve to meet the relentless demand for productivity, profitability, sustainability, and food safety? How do people achieve these demands while retaining all the values and qualities that drive their desire to be working with and in the natural environment?

As we face these challenges, doing things differently will be crucial. New and existing knowledge and technology will be essential in enabling people to be successful and to feel satisfied with their efforts.

Enabling behaviour change and encouraging technology uptake and practice change isn't simple. There is a level of change that naturally occurs as initiatives are developed by people and they share ideas and talk "over the fence". But enabling change across a greater proportion of the community, and at a faster rate of adoption, doesn't just happen – it has to be planned for.

How we improve the process of developing, sharing and supporting the adoption of this knowledge and technology will have a big impact on how people respond. Lessons from widespread research across many fields, including agriculture, engineering and health describe both successful and failed extension programmes.

To achieve a good return on investment in research and development, we need effective programmes supporting adoption and behaviour change. Opportunities may arise from new research programmes, or they might be "old" or existing ideas that have been under the radar but changed circumstances now make them very relevant and applicable to a wider audience. Irrespective of how knowledge and technology arises, collaborative processes involving a range of people and expertise working together is necessary to achieve best outcomes.

An extension strategy should establish the principles that guide your programme design, shape and manage delivery of activities, and guide monitoring and evaluation. The strategy must be developed at the beginning of your project, while still aligned with any research and development that is required.

This set of resources is intended to encourage critical thinking to help participants at all levels develop programmes that work and help others to change behaviours across the primary sector. Our aim is to enhance our natural process of over the fence learning with the application of broader thinking and better design of formal extension programmes.

## WHAT TO EXPECT IN THIS HANDBOOK

This handbook is in two sections. The first outlines the principles that need to be understood before more effective adoption of new knowledge and technologies can be planned. The second section provides a framework to put those principles in place in an extension and practice change programme.

The development of a programme can then be tailored to both the technology and the audience. Programmes could be stand-alone or within larger funded objectives. The purpose is to support critical thinking and reflection on all the different facets involved in designing a successful extension strategy before you think about the activities and delivery.

The aim is to provide a resource to help build an effective extension programme and avoid pitfalls that can reduce impact.


Hopefully some of the points raised will create the same sense of "aha" for you as they did for us when we reflected on both past successes and failures. A key driver of this handbook is to provide increased understanding and tools to reduce the gap between "what is known" and "what is done" to improve the outcomes of any programme, large or small.

Some of the most effective extension programmes have been the result of a combination of research, development and extension activities over many years. Adoption isn't always immediate, simple or as expected.

This handbook follows themes of system complexity, behaviour change, barriers to adoption, knowledge, planning, and monitoring and review. The final section includes quick tips and tricks that are an assimilation of activity design and lessons from successful programmes.

Becoming an effective practitioner requires that you:

- understand participants' decisions and perspective;
- understand the range of barriers to adoption across your target audience;
- undertake careful planning and delivery;
- incorporate monitoring, review and redesign at the beginning and throughout the project; and
- develop appropriate extension activities in conjunction with participants.

# SECTION 1: PRINCIPLES OF EXTENSION

## 1 WHAT YOU NEED TO THINK ABOUT TO DESIGN AN EXTENSION PROGRAMME

How many times is the word "just" used in front of a potential solution? For example "you just need to do x or y". People tend to use previous experience to frame their view of a problem to handle it more readily. Instinctively, we tend to initially avoid in-depth thinking – it takes time and effort and there are always competing demands. Our challenges, however, are becoming more complex as the pressure for greater productivity and efficiency in the primary sector increases. This means that extension programmes need to start with a greater understanding of each system and its complexity as part of the planning process.

### Complex problems and complicated systems

Today there is increasing complexity in everything we do. If something is difficult to understand, use or implement then people are unlikely to do it unless the benefits are compelling. Excessive complexity can be an important obstacle to adoption.

"Complex problems have simple, easy to understand, wrong answers." -Henry Louis Menken (1880-1956)

Complexity can be evident at two levels: in the technology or innovation to be adopted and within the system it is to be applied to.

To design effective extension programmes we need to understand the problem, the solutions we are proposing and the systems into which we expect these solutions to be applied.

Technologies and innovations range from simple to complicated to complex as described below. It is important to identify where your technology fits so that you choose appropriate strategies, partners and processes that increase the impact and the rate of adoption and behaviour change.

MPI has developed an extension framework (Appendix 1) as a way at looking at the different types of strategy that may be needed in an extension programme. Within any programme, however, there is likely to be facets of transfer, adoption, adaptation and co-innovation, as described in this framework, as different project targets and needs are addressed.


- **simple:** An example is in the kiwifruit industry **(SFF 06/090)** where new spray nozzle technology was adopted by 80 percent of spray contractors within the three years of the start of the SFF project.
- **complicated:** Examples include mobile apps (www.deerfeed.co.nz) or economic breeding values for sire selection (SIL - https://www.sil.co.nz/Files/FlockFinder-app-user-guide-v02-03.aspx).
- **complex:** Examples of technologies that are complex or involve application complexity include new forages (for example, plantain and lucerne), lambing hoggets, and conversion from dry-land to irrigated farming.

## Simple

Simple systems or technologies are those where there are few interactions with other factors and the outcomes are known, such as animal health vaccines. These technologies are simple to understand and easy to implement. They impact mainly on the target with known outcomes.

The challenge can often be:

- complacency – good initial adoption and benefit followed by failure to maintain practice such as maintaining selenium application every year; and
- misuse or misunderstanding – the "one is good, therefore two must be better" approach to medications.

## Complicated

Complicated systems or technologies have many more interactions, but the inputs and practices are defined and the outputs are predictable. In practice these technologies may be easy to use, but there is often a need for the technology to be applied in a structured or systematic way. Examples of complicated systems include plant or animal breeding and genetics where attention to detail and timeliness can be required, as well as an understanding of priorities and risks.

Increasingly, there is an opportunity to embed the background knowledge and expertise into a more useable format thereby reducing the effort and interaction required by the adopter.

## Complex

Complex systems or technologies have many features that may follow a pattern, but can interact in many different, possibly unknown ways. Two key features of complex systems are unintended consequences (emergent properties) and the difficulty participants can have in making sense of a situation. These features can be a factor in the failure of an extension programme.

Complex technologies:

- are potentially hard to implement in a farm system and may cause disruption to the wider system;
- often make it hard to determine progress or benefits, because system change displaces the status quo and old performance benchmarks; and
- mean some knowledge and risks may be unknown, especially where the technology is being applied away from where it was developed or evaluated.

Examples of technologies that are complex or involve application complexity include new forages (for example, plantain and lucerne), lambing hoggets, and conversion from dry-land to irrigated farming. While the technology, such as irrigation, is known and relatively "simple" the application requires significant changes to the farming system to capture the full value, making it complex to the end user who has little or no knowledge of the new system.

Complexity may lead to greater inertia in adoption, as participants need more time and effort to develop their skills and understanding around the application and require some experience over time to fine tune those skills.

## Why is this important to know?

Many of the farm or other biological systems that we need to work with in an extension programme are complex and considerable expertise is required to understand the systems.

The farm system is the example used here but is a synonym for other systems. Figure 1 is a good visual representation of a farm system showing many of the variables and possible interactions where the circle represents a system boundary, such as a business unit.

When one part of the system changes it affects other parts of the organisation and functionality in both known and unknown ways. To add complexity to this, there are also external factors that impact on the system, such as market, regulatory, societal and environmental forces.

Complex emergent properties that might occur due to farm system changes are not normally predicted by simply understanding the behaviour of the constituent parts underlying them. For example, the agronomy of the lucerne plant and its management and performance is better researched and understood than are the farm system impacts of planting large areas of a farm in lucerne **(Lucerne4Lambs SFF 09/112).**

The question is – how is your proposal for a new innovation, practice or technology going to impact on the farm system, or alternatively what impact is the farm system going to have on any extension strategy?

### What does this mean when planning your programme?

Systems thinking has been described as the "art and science" of handling interdependent variables instead of just looking at the independent sets of variables. Systems thinking is a way of simplifying complexity as described above.

Systems theory and systems analysis provide tools that allow us to enhance the natural ability of bio-physical systems to adapt and change over time. These can help programme planners to analyse the context in which participants are trying or needing to change practice.

Examples of these tools include:

- SWOT (strengths, weaknesses, opportunities, threats) analysis; and
- Porter's five forces – this tool was created by Harvard Business School Professor Michael Porter to analyse the attractiveness and likely profitability of an industry. It helps you understand both the strength of your current competitive position and the strength of a position you are considering moving into.

## What do programme participants know and understand?

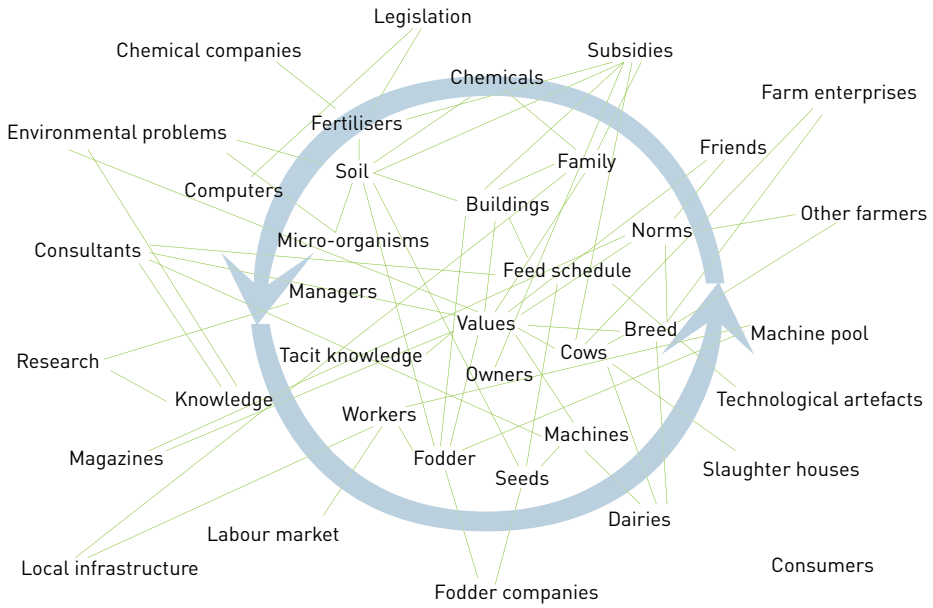
Many extension programmes assume that providing knowledge is a precursor to adoption or practice change, without much consideration of what participants *already know*, what they *need to know*,

## CONSIDER THIS...

### Pitch your programme appropriately

- If it's a simple technology and the barriers to adoption are low then don't over-complicate the programme – that just adds expense. But to ensure success, it's your responsibility to really understand your technology and the barriers to adoption and validate that the technology really is simple and that there are few barriers.
- More often the challenge needing to be addressed is complex – most people have "done the easy stuff", although not always well and often not consistently (which is something to consider in developing an extension programme). Business and biological systems are naturally complex. It's not just the bio-physical production system that you need to consider, social and economic dynamics also need to be factored in.
- Understanding the complexity and interactions within a system, as well as the unintended consequences or emergent properties is critical. The more complex the technology or innovation, the more difficult or slower the adoption process might be. Lack of insight into the system may explain poor uptake or non-adoption of some technologies.

**Figure 1: Farm system diagram (Source: Noe and Alroe, 2003)**



and how much knowledge is required before participants are inclined to take action.

In an extension programme it can be too easy to overlook, or assume, the level of knowledge of all the participants.

Programme planners need to recognise that:

- participants will all start with different levels of understanding, experience and knowledge;
- all will be experts in their area of specialisation (for example, farmer, consultant, scientist, agribusiness representative or banker); and
- some experts can be gatekeepers or negative influencers.

In addition, there can be a danger in assuming that the programme team has all the answers. Be aware that interactions that occur during an extension programme may well produce new outcomes.

It can be of value to consider this:
There are "known-knowns" – these are things that we know we know.
There are "unknown-unknowns" – these are things that we do not know we don't know.
There are also "known-unknowns" – these are the things we now know we don't know.

Adoption and practice change requires that experts with different technical and scientific knowledge need to interact with other experts in action and tacit knowledge, such as farmers, growers, and fishers.

There are three concepts (Snowden 2002) that illustrate the change in thinking required to manage this pool of knowledge which are useful to consider in planning any extension programme:

- **Knowledge can only be volunteered** – you never know if someone is using their knowledge. This is an important reflection on the level of knowledge of the target audience.
- **Sharing knowledge has an order** – we always know more than we can tell, and we will always tell more than we write down – simply we can say more than we write down. The actual process of writing, however, also includes reflective knowledge (adding and taking away from the actual experience, verbal presentation or original thought). For example, consider how you replied "off the cuff" to a question during a recent presentation you gave. Often, after the event you are able to reflect on other or more appropriate knowledge that you could have shared that could have benefited the audience in relation to the question.
- **We only know what we need to know when we need to know it** – the use of knowledge is triggered by both context and circumstances. Creating the right context is important for encouraging prior knowledge to be resurrected or applied to the prevailing circumstances. Consider the development of drought conditions and people's reaction and the timeliness of their response. When drought conditions develop following a series of favourable seasons, decision-making is typically slow and actions are usually inadequate. By contrast, when farmers have experienced several successive very dry seasons, they act earlier and more decisively when the next hint of a dry spell starts to develop.

## Are the participant's novices or experts?

Both your programme team and expected audience will include a wide range of people from varying backgrounds. Understanding the experience they bring, as well as any myths or misconceptions they have, is also important. There are many terms to describe this experience, such as explicit, tacit, codified and scientific knowledge.

**Explicit knowledge** – formal, systematic and easily communicated – expressed using language (such as factsheets, research papers and instructions), numerical, mathematical and scientific formula.

**Tacit knowledge** – personal knowledge embedded in an individual's experience and includes intangible factors (such as personal belief, values, insights, hunches and intuition). http://www.link.com/donclark/knowledge.html

**Scientific knowledge** – based on experience and observation, and uses scientific method and data measurement and collection. It is explicit, codified knowledge.

**Codified knowledge** – this is public knowledge, and is validated through peer review, educational process and debate. It is presented therefore in a usable and relevant form for the participants.

## Learning or re-knowing

Most people would not consider themselves "learners", as the implication is a "novice" learning a new skill. They are more likely to consider their own learning as increasing their understanding or a process of continuous improvement. Adults are internally motivated, practical and, most importantly, they like to be respected.

What does this mean for extension programmes and how does it relate to behaviour change and motivation?

## People need to know why they should learn something

People can spend a considerable amount of time and energy exploring what the benefits are to learning about something before they are willing to invest time in it. They are more likely to resist learning when they feel others are imposing information, ideas or actions on them. This is a challenge when the information or technology is new, is disruptive to the status quo, or if those involved are unaware of the benefits or all of the knowledge required to implement change.

People need to be self-directing. Good project design ensures:

- "learning" is initiated by the participants;
- participants' experiences and "expert" knowledge are incorporated effectively;
- participants are actively involved in the process of design and evaluation of the programme; and
- beyond the project, participants have the ability to access a wide range of people, information and resources to learn more.

A key concept here is that access to information should not be a limiting factor and effective extension enables this, such as websites, text messages, and newsletters.

Adults have a broad base of knowledge and experience to help develop new ideas and skills. People like opportunities to use their existing foundation of knowledge and experience and to apply it. People become motivated when they see the need to address a real problem or issue with immediate relevance to their situation.

### CONSIDER THIS...

**Successful extension programmes:**

- are based on activities that reflect the actual work of the participants;
- make use of real case studies from participants to ensure the programme is successful;
- provide activities that enable participants to compare their own experiences with the new technology, innovation or ideas;
- provide the opportunity for participants to reflect and build upon their experience; and
- allow for incidental and unplanned "learning" that may occur and can be included in the programme.

### CONSIDER THIS...

**When developing extension programmes make the effort to:**

- understand the attitudes and values of participants – they shape current practice, and indicate what might be barriers to change and uptake;
- identify the readiness of the participants for the new information, for example, determine if they need a new information or technology; and
- provide the opportunity to acquire the new knowledge in a way that makes it easy for people to access information when it is needed, for example, websites can make information available beyond the life of the programme.

### Provide practical solutions to problems

Adults look for knowledge when they need answers to problems. Successful extension messages and activities will be based around solutions to identified and relevant problems if they are to result in increased motivation and high levels of engagement.

In the primary sector participants are practical, so engagement can be much more effective when it is in the field and participants are able to see practices or technologies.

Often knowledge may need to be interpreted to reflect the practicalities of the farm or other system. Timeliness is relevant – participants are more likely to be interested in information that they can use now, and less inclined to engage with material that they need to store away for when they might need it in the future.

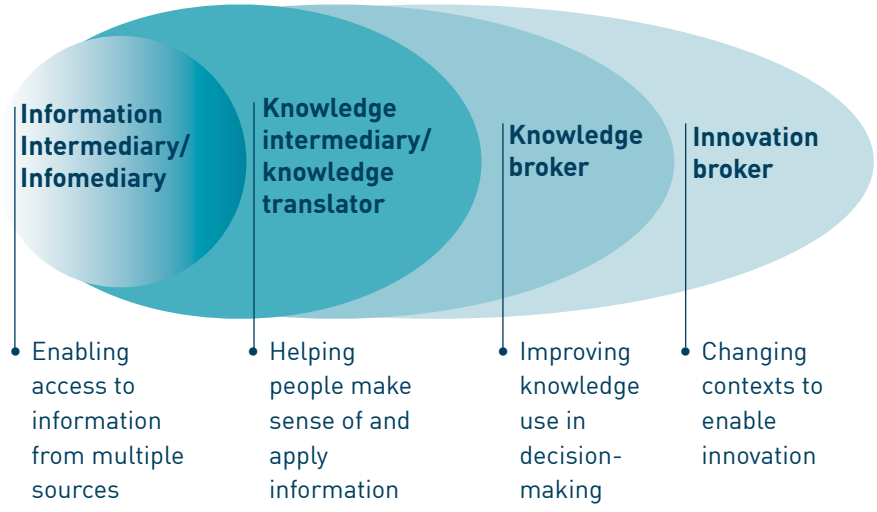
### People are motivated by both extrinsic and intrinsic motivators

People are driven by intrinsic (internal) behaviours and beliefs such as their autonomy, self-efficacy or achievement, and without needing any external reward. Extrinsic (external) motivators are those outside the individual and include social, environmental, cultural and economic systems. Common extrinsic motivations are both positive and negative, and include rewards (for example, money or promotion) for showing the desired behaviour, and the threat of punishment or regulation (for example, fines).

## Developing and sharing knowledge

"Knowledge brokering" could be described as bringing people together, to help them build relationships, uncover needs, and share ideas and evidence that will let them do their jobs better. Invariably, there can be a variety of terms used to describe the various stages and roles in the processes that range from enabling access to information through to the sharing of information and nurturing of innovation to enable change, Figure 2.

**Figure 2: Information, knowledge and innovation in the process of enabling change**




Note: The notion of broadening knowledge and expanding understanding as people move beyond information is deliberate.
Source: From Knowledge Brokering and Intermediary concepts. Retrieved from: https://dl.dropboxusercontent.com/u/59998813/Evaluating%20the%20impact%20of%20knowledge%20brokering%20work%20discussion%20summary%202012.pdf.



The notion of broadening knowledge and expanding understanding as people move beyond information is deliberate.

## Knowledge brokers

What distinguishes knowledge brokers from others is that the knowledge they seek to broker is not their own or produced by an organisation to whom they are affiliated. They do not provide answers; instead they enable participants to answer their own questions and act based on the best possible knowledge and information.

A knowledge broker is the intermediary between knowledge producers, such as scientists, and those who use knowledge, such as policy-makers, end users such as farmers and the general public.

"Knowledge brokers try to bridge the gap that can exist between those two worlds and build connections." (Morgan Meyer)

Knowledge brokering may occur via activities that provide the connections and links to know how, understanding and application. Knowledge brokering may comprise a part-time role for people working elsewhere in the industry, so it's important to focus on the activities and processes, not the individuals.

## Knowledge translation

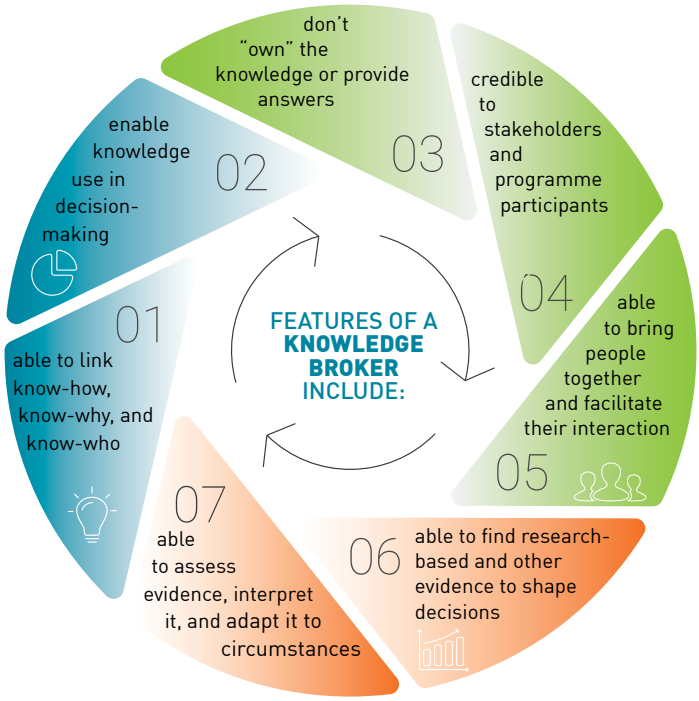
"Knowledge translation" is a term for all of the activities involved in moving research from the laboratory, the research journal, and the academic conference into the hands of people and organisations that can put it to practical use. It is a method for closing the gap between knowledge and practice, which will differ according to the type of research, the timeframe, and the audience being targeted.

Knowledge translation is not simply a synonym for technology transfer. A key principle of knowledge translation is the use of credible evidence-based research data. It is aligned to many other terms that are used for the process of putting knowledge into action (dissemination and diffusion, research use, and knowledge transfer and uptake are often used).

## Innovation broker

"Innovation brokers" are the people in organisations who provide the critical function of information exchange. They seek out connections between people and ideas and foster conversation and interaction. Where cross-discipline and inter-team work is producing new ideas and thinking, there is often someone playing the role of broker, who sees a connection and brings people, ideas and practices together.

**Figure 3: Features of a knowledge broker**




## CONSIDER THIS...

### Information should be provided in a way that:

- is practical and timely – design to provide solutions or information at the right time to be included in their future plans, for example, pregnancy nutrition information should be provided around weaning as that is when the planning for the next mating should begin; and
- constructs the link between the new information or technology and the application of that knowledge to practice.

## Why understand behaviour change?

Understanding why, how, when and where people change behaviour is important in improving the effectiveness of any programme.

The aim of any extension programme can be to:

- inform or educate;
- change attitudes (direct); or
- change behaviour without changing attitudes (indirect).

Why do people do things a certain way? Why do so many people fail to do what appears obvious? Why does a particular policy result in quite unexpected responses? The theories about human behaviour help explain this.

People's behaviour represents concrete decisions and actions taken by individuals and groups, often rooted in underlying values and attitudes. It is these features that need to be addressed for change in practice to begin.

Many theories have been developed to try to understand and explain human behaviour. Many factors in how people behave are deeply ingrained, and have both social and institutional contexts. It is the relationship between attitudes (such as beliefs, values, perceptions, knowledge, awareness, opinions and concerns) and behaviour that can be seen to influence adoption and its success.

### Using behavioural models

An understanding of theories of behaviour change (Appendix 2) can help target extension programmes to gain the most successful and effective adoption possible.

Each of these models provides a basis for thinking about the process around behaviour change and why some programmes work when others are less effective. For example, the deficit model approach is often used in response to the perception that limited or poor adoption is because of a lack of information. Typically, only when the desired outcome is not realised is an effort made to understand the real barriers and issues.

CASE STUDY

### ADOPTING PRACTICES WITHOUT CHANGING BEHAVIOURS

- People can change behaviour or adopt alternative and beneficial practices without changing attitude. In recent activity with North Island sheep and beef farmers, most recognised that the seasonal conditions they have experienced have been more variable, and summer dry/drought conditions have been occurring more frequently.
- In response, they have considered and adopted practices that provide greater resilience to climatic variability for their business. Yet many don't acknowledge these changes to be functions of climate change and remain highly sceptical of anthropogenic climate change.

# 2 BARRIERS TO ADOPTION

Underlying behaviour of participants is one of the barriers to success. Recognising and understanding barriers to adoption can provide the opportunity to design a more effective extension programme. Appropriate strategies or actions can then be chosen to enhance adoption.

Many of the barriers outlined here may not normally be considered when implementing a new programme, but understanding and recognising which may be important to your particular research or extension programme is a step closer to a successful outcome. No single barrier or type of barrier is most important or more important than another.

## Potential barriers

Potential barriers come in many forms. Refer to the list below throughout the development and implementation of an extension programme to help you address potential barriers for more successful outcomes.

### Self-efficacy

This is the extent or strength of a person's belief in their own ability to complete tasks and reach goals. It is the ability to persist and succeed with a task and therefore is a key component in developing adoption and behaviour change programmes. It is the answer to the question *"Can I see myself doing this?"*

Feedback from self-monitoring or record-keeping can improve a person's belief in their self-efficacy and is a useful tool in many adoption programmes. Reinforcement or rewards can also play an important role. The right sort of information can also help people understand an issue in their own terms.

### Locus of control

This is the extent to which we believe that we can control events that affect us. People with a strong internal locus of control believe their actions can bring about change (these could be programme leaders, researchers, facilitators or producers). People with an external locus of control feel their actions are insignificant and other more competent or knowledgeable people are needed to make things happen. A good example is climate change which can be described as coming within a person's area of concern, but not within their area of control.

### Habit

Habits can be hard to identify and tend to be the automatic things we do without thinking, for example, standard operating procedure or "the way we do things around here". They are part of the routine of the day that enable us to function effectively and are therefore one of the key challenges to changing behaviour.

### Time constraints

Time is often ignored in an extension programme. It is important, however, in considering the potential number of opportunities a person has to adopt a new technology or innovation and make changes to their practice. In the primary industries many actions only occur once a season, for example, mating or pasture renovation, which limits the potential rate of change. Some decisions take many years to implement and the opportunity to change is limited, such as major breed changes.

Some management practices, however, may have indicators providing a number of monitoring points throughout the season (for example, daily milk production is an indicator of the level of nutrition, and regular weighing of stock provides an indication for nutrition and health across the system) enabling more rapid response and behaviour change.

### Degree of complexity

Degree of complexity of the innovation or technology can be a significant barrier to many farmers or farm systems. This is where good prior skills and a deeper understanding are required to implement the new practices and need to be considered in any planning.

### Latency

This is the delay between any imposed change in a system and the resulting effect. This can mean that the link between the change and the effect are not recognised, such as a seasonal or one-off event. The initial effect may be recognised, but any subsequent change in the system is not associated with the change.

### Denial

Although denial seems to be an obvious barrier to adoption it is often less considered when planning a programme. Using climate change as an example, denial is a common response. It can be a defence mechanism and a refusal to accept reality that may be related to a person's beliefs, knowledge or locus of control.

### Inertia
When faced with a difficult decision or one that involves too much choice, people may choose not to change behaviour at all or just choose the easiest option (path of least resistance). Examples we easily recognise include financial decisions (insurance, structure of their mortgage, decision to remain with a bank), management in the face of a developing drought, or changing energy supplier.

### Gatekeepers
Gatekeepers come from the wider range of people involved in the farm system or relevant industry at all levels and can have significant influence on both the decision-maker and the decisions. This includes within the farming family and farm business structure, for example, the farm manager, share milker and corporate owner. Increasingly, the rural finance sector is having a significant impact as they control the financial resources. The wider primary sector including accountants, seed, fertiliser and livestock representatives and consultants bring their own knowledge, attitudes and behaviour to interact with the adoption of any new practices for a farm business. Similar examples can be found for arable, forestry, viticulture and fisheries businesses.

For example, the agribusiness sector was identified as potential gatekeepers with respect to changing lucerne management in Central Otago **(SFF09/112)**, and therefore including them in the extension plan was critical.

### Media
The media is often quoted by farmers as an important source of information. The information presented in the media, however, may not be adequate for decision-making as media can focus on the problems rather than the solutions. In some areas, the media can have a greater influence, such as climate change, water quality or the impact of dairying.

### Values
Values are important and lasting beliefs or ideals shared by the members of a culture about what is good or bad and desirable or undesirable. Values have a major influence on a person's behaviour and attitude and serve as broad guidelines in all situations.

There are many situations, however, where people's values either are in conflict or result in a trade-off in terms of decision-making. For example, the use of biotechnology to produce new medicine was favoured by nearly 80 percent of people worldwide whereas only 34 percent supported its use in the production of genetically modified food; yet over 60 percent supported developing new nutritious food crops. The same technology is used in all three situations, but people's values shift depending on the context.

### Level of trust
Distrust can be a barrier if there is a lack of understanding or confidence in the science, the information provider or the legislation. An example could be the use of Overseer® and its inclusion in regional plans across New Zealand.

### Social dilemma
A social dilemma can be described as the conflict between self-interest and what is good for society at large and is often a barrier in environmental changes. Regional water plans are an example where environmental concerns can potentially conflict with irrigation programmes, farm water use or farm management.

### Non-immediacy of the problem
If an issue, such as climate change, is seen as distant (in time or space) it can be a barrier to immediate action. Similar issues occur with long-term plans such as future changes to water allocation, fisheries quota, and export markets.

### Resistance
A participant's own knowledge means they cannot easily see beyond their current practice and may feel that "It's all very well on his farm but it won't work on mine". In a complex system it is very difficult to visualise or understand the system any other way and many farmers, producers and managers may not recognise or acknowledge these limits.

### Framing
Frames are the deeply held perspectives and assumptions that people hold. This can determine the way any information is interpreted, and if the facts don't fit the view (frame) then the facts may be rejected. The decision made by the individual can depend on how the options are presented to them. For example, framing the same choice positively rather than negatively, or as a profit versus as a loss, for example, can alter the decision made.

For example, in many regions the argument is that irrigation will solve growers' problems as droughts

occur more regularly. This fits a political and economic frame of increased productivity and export receipts. The changing land use, however, may not improve a farm's profitability and may have other impacts such as increased runoff and nitrate leaching.

## Knowledge

Knowledge includes what is already known, plus, what your participants know. Understand how this knowledge fits into a new programme and how you can adapt your programme to take participant knowledge into account. The problem can be that people with knowledge (experts) can resent engaging in knowledge transfer at a level they passed long ago, or as Snowden (2002) describes it... "They will visit to teach but not to collaborate". This is a potential barrier or limit to flow of knowledge and yet critical when ensuring projects have the best information for dissemination.

## Commitment of resources

Resources such as finances, land and labour may be significant barriers to adoption for many businesses. These resources may not be controlled by the grower but by financial institutions, corporate owners and lessors.

## Facilitators

For facilitators presentation style, delivery, language, eloquence, attitude, lack of knowledge of farm (or other) systems can all be factors that limit the credibility and success of facilitators in a programme.

## Access to information

Limited access to information can be a significant barrier to adoption. Conversely, information that is made readily available, accessible and credible can speed the time to adoption significantly. Although information (or data) alone is insufficient to lead to practice change it is required as a source of knowledge.

The importance of access to information was highlighted in the SFF Focus on Deer **(SFF 05/103)** where research found that regular attendees to the focus farm field days made an average of 4.6 changes on-farm as a result of what they saw, and farmers who never attended a field day but still read the newsletters, made an average of 2 changes.

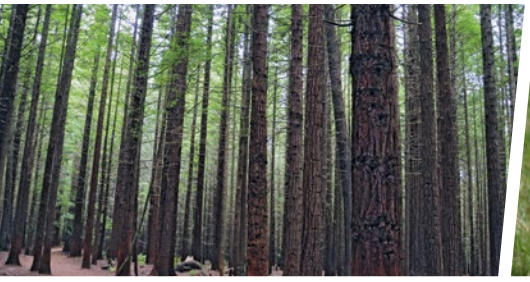
## Poor prior experiences

If farmers have tried a technology in the past and it hasn't been successful, it can greatly impact on how much energy and time they are willing to devote to new approaches. This may be due to many reasons such as where the practice is undeveloped, a poor fit in the system, or interaction with other factors such as unknown pests and diseases.

## Age

Age is often considered a barrier to adoption by many providers, but we can also argue that the knowledge, experience and resources that come with age can assist or are even required to enable effective practice change.


M Casey



# SECTION 2: HOW TO DESIGN A PROGRAMME

## 3 PLANNING YOUR PROGRAMME

While no one plans to design an adoption or extension strategy that fails to deliver, there is often the opportunity to do better. By considering the extension process right from the initial design of your technology development you should be more prepared to answer the "so what?" questions.

Knowing and understanding current perceptions of the participants, plus any required actions and outcomes, should be the starting point for:

- identifying issues and drivers;
- identifying likely barriers to adoption;
- selection and design of extension strategies; and
- benchmarking current practice and behaviour.

Extension strategies should not be an add-on at the end of any research and development programme.

To help with development and implementation of your extension programme a set of questions is provided (Appendix 3: Getting your programme started). They are designed to help in both designing and evaluating your programme and answering the so what questions.

This approach encourages alternative ways of seeing and acting, aiming to provide your programme with unexpected possibilities. The reason for doing this is that conventional solutions don't always work. If they did, the problems we are trying to tackle would probably have been solved long ago.

### Building the right team

It is nearly impossible for you to devise, design, implement, manage and deliver an extension programme on your own – well at least one that is effective! While we all start as enthusiasts for the programme it is important to consider who will fill which roles in the team.

The breadth of knowledge and understanding needed around the knowledge or technology means that some sort of team will be needed – that's despite all the multi-skilling and multi-tasking that will invariably occur as team members cover several roles.

Creating the right team is important to success. A "perfect" team should include people with credibility and understanding of the community being worked with. Avoid the tendency to fill the team with similar or like-minded people. Broadening the mix of skills and experience within your programme team should also expand the pool of potential advocates for your programme. What you need to consider is what needs to occur for them to want to join your team.

"A team is not a bunch of people with job titles, but a congregation of individuals, each of whom has a role which is understood by other members. Members of a team seek out certain roles and they perform most effectively in the ones that are most natural to them." - Dr R M Belbin

There will be critics: How can their issues or concerns be addressed? Would inviting them to participate in the programme design and management process enable better outcomes?

If the change required by your target audience is very complex, has conflicting drivers, or requires significant system-wide implications then developing a "co-innovation" approach may be appropriate. This type of approach requires extensive collaboration between stakeholders. This approach would provide the opportunity to access a range of knowledge and skill bases to maximise the opportunity of the technology or practice.

## CONSIDER THIS...

### Building a team requires:

- A good team requires technical (such as scientific or data skills), management, behavioural, financial and IT skills.
- Who are the communicators, facilitators, resource developers, integrators or finishers in your team? Often we consider the technical requirements in some detail and ignore much of the rest.
- The role and influence of an integrator or "listener" can be critical in reshaping programmes or identifying the questions that you may be failing to answer the why or the how?
- Establishing a programme champion or key influencer can be helpful in building awareness and can add to the credibility of the programme. Industry participants can add their own perspective to the planning process and can often enable access to different networks and processes.
- Consider the roles, strengths and allowable weakness of team members. There is a variety of resources providing assistance in this process.
- Are there other groups with similar projects or goals, and also importantly, engaging with the target group? Is it appropriate to align with them and what benefits and risks would that entail?

**Team-building checklist**

| Recommendations | Critical | Important | Nice to have |
|---|---|---|---|
| Project planning and design team members possess a multidisciplinary set of skills and experience | ✓ | | |
| Project manager chosen for their skills in project management rather than their knowledge of the technology | ✓ | | |
| Project planning and design team includes participants from the local community of interest | ✓ | | |
| Does your team have credibility, expertise, IT skills, listening skills, resource investigation skills, outside the square thinking, good networks (research, industry, end users) | ✓ | | |
| Extension strategies are incorporated from the start of the programme and are ongoing and reviewed regularly | ✓ | | |
| Knowledge or innovation brokering skills are included within the team | | ✓ | |
| Team members primarily responsible for project design and implementation should not have primary responsibility for evaluation and beneficiary assessment activity | | ✓ | |
| Impact evaluation (design and activity) is incorporated in project design from start | | ✓ | |
| Evaluation and data quality expertise is included in project management team skill set | ✓ | | |
| Impact evaluations involve several rounds of data collection providing data on changes over time, and resilience of behaviours | | | ✓ |

## What has your programme got to offer?

Identify clearly what is it that your programme will have to offer participants and what is it that you expect them to do, or benefit from, as a consequence. Think about this from the perspective of potential participants. Use your audience's language to describe the practices they will be expected to change.

### Benefits

- The programme needs to provide benefit to the participant. Identify where the benefits for the participants will be evident, for example, personal, lifestyle, monetary, social, environmental or sustainability outcomes.
- Recognise that outcomes will vary by participants, based on different understandings, variable application of the information, environmental factors, and the dynamics that occur within biological systems. Be aware and communicative about this variability from the beginning.

### Costs

There is always a cost to be incurred with change. Some costs are quite simple and apparent (seed,

## CONSIDER THIS...

### Determining the net benefit

- Determine what the recipients' value. This may not be monetary.
- No matter how good the potential benefits are, if the effort and inputs are too difficult or costly for participants then adoption and effectiveness are likely to be limited.
- If you cannot be clear and concise about the benefits or costs then perhaps consider trialling the programme to assess the technology in a range of environments, and quantify the range of benefits and costs.
- Develop benchmarks at the beginning of a programme to help define impact and change, year by year.
- Identify competing uses for resources and assess your technology against these.

## CASE STUDY

**Recognising your ideal**

- In the **Lucerne4Lambs SFF (09/112)** the "ideal" outcome at the start was that the majority of Central Otago farmers that grew lucerne would be grazing it in spring with ewes and lambs.
- The personal drivers for the farmer were: how to manage a grazing lucerne system; how much lucerne they needed; and managing winter feed supply.
- The programme "achieved" increased awareness of the resilience of a lucerne system for both grazing and supplement use in a dry environment; increased area sown in lucerne; development of a suitable lucerne system for grazing that also supplied adequate winter feed; and analysis of the financial benefits of shifting to a lucerne system over time.

Dr K Pollock

stock, technology), but the less obvious costs associated with changing habits and behaviours must also be considered. These costs might include:

- time required for learning, understanding, and thinking through the application;
- reallocation of effort and time required to learn new skills and practices;
- investment in new resources;
- identifying in-kind contributions (not direct cash costs) can be difficult and therefore can be undervalued; and
- time and interaction reflecting on outcomes and appraising benefits and value.

## Value

The value of making the change is the net benefit. Valuing the outcomes of a change can sometimes be difficult to determine. It's easy to forget just what things were like before change was made, and typically the good features are easily reflected on, while the less desirable features are skipped over. From the perspective of the participants, they are more likely to attribute progress to their own effort and undervalue the impact of the programme itself – the tendency for personal claims of success.

**Measuring change:** Can you help adopters devise a way to retain a control group against which the "changed system" can be evaluated? Or can you document the "old" state to help demonstrate the benefits of change? Making it easy to quantify benefits and the value of change can be very effective in building confidence and credibility and reinforcing participants' skills and abilities, along with their sense of self-efficacy.

## Success

It is crucial to consider what success might look like, as measured through changed attitudes, behaviours and practices amongst the target audience or community.

The challenge when considering success is to be realistic in your assessment. Think about how each of the questions below would be answered in relation to the change you are asking participants to make (adapted from https://econsultancy.com/blog/64162-what-does-success-look-like).

- **The ideal:** What is the grand vision of what the programme will ultimately achieve? It may be that the vision is unachievable – an ideal rather than a target.
- **Personal drivers:** What would each individual programme member like to achieve? Better

## CONSIDER THIS...

### Some specific indicators of programme success may include:

- Your programme outcomes are recognised by the wider community (create a buzz).
- The information from your programme is widely available and readily accessible.
- There is a growing group of people with knowledge and understanding based on your programme.
- There are known champions for the information and technology – researchers, industry leaders, farmers, business representatives.
- People are making decisions based on the knowledge and outcomes of the programme.
- People would recommend the technology or practice to a friend, neighbour or family member.
- People have changed behaviour or practices.



understanding the needs and wants of individual participants can help with knowing where people's strengths and passions lie.

- **The optimal:** What do you think participants most value? This is an area that you may learn more about as you receive feedback on the programme. This information can then be used to help you determine what's feasible and what works (feedback as the programme delivers).
- **The achievable:** What can be delivered in the desired timeframe with the available resources?
- **The specification:** What are you contracted to deliver? This is defined after contracts and a budget have been developed and are reported through milestones, KPIs, quarterly reports.

## CASE STUDY

### IDENTIFYING KEY BENEFITS

- In a SFF project **(No More Bearings 08/026)** that looked at health issues in sheep the key benefits to the farmers included time and cost savings from changing grazing management rather than just the expected reduction in lamb and ewe losses.

# 4 HOW IS YOUR PROGRAMME GOING?

## Monitoring, evaluation and review

A monitoring and evaluation component starts from the beginning, in the design of the programme. Well-designed monitoring and evaluation can provide timely insight around assumptions, beliefs and behaviours underlying both the identified problem or issue and the programme.

This reflection can enable programme designers, managers and funders determine:

- the validity and appropriateness of the perceived issue;
- drivers of current beliefs, knowledge and practice;
- relative understanding of the system;
- the extent of divergence between how the various participants see and understand the issues;
- when, where and how the programme needs to be redesigned, reinvented or evolved;
- when, how and how well the expected outcomes were realised;
- unexpected consequences and their impact; and
- the appropriateness of future investment.

Successful programmes work with and manage both the desired as well as the unexpected consequences. Real-time monitoring over the life of the programme enables pro-active adaptation and reduces surprises.

Monitoring is the systematic data collection for use in decision-making and planning. Evaluation is used to determine the merit or worth of the object being evaluated, such as a programme, a project, a policy, a product or an event.

### Monitor and evaluate at the right time

Effective programme design and management requires indicators (data or benchmarks) that provide information before or during important changes in the programme and environment.

These can be described as follows:

- **Leading indicators** (benchmarks) provide information before the programme starts, such as level of fish stocks or pest prevalence.
- **Coincident indicators** provide information at about the same time as the result, such as weaning weight or BCS, and brix measurement.

## CONSIDER THIS...

### Key points to monitoring and evaluating a programme

- Identify what success will look like in a measurable way that you can communicate to different audiences.
- Plan and budget for monitoring and evaluation and build them into your programme from the beginning.
- Establish a benchmark by collecting baseline data at the beginning to compare against the results of your programme.
- Share your findings with participants and stakeholders along the way – it will help to build enthusiasm, credibility, awareness and adoption.

- **Lagging indicators** provide data after the result takes place, often with considerable time lag due to data collection routines and slow output, such as lambing percentages or harvest data.

In many programmes leading or coincident indicators are more useful. If you rely on lagging indicators, by the time you know about a change, it may be too late to act.

## Recognise the potential for blind spots in any programme

A programme that focuses on predictable, linear cause-and-effect responses combined with a top-down dissemination of science ignores the broader range of possible outcomes associated with the intervention or system (intended, unintended, positive or negative).

Check for assumptions, myths and biases at all stages of both planning and monitoring. See Appendix 5 for blind spot analysis questions that are helpful to use for both monitoring or planning and designing a programme.

## Clarity in monitoring and evaluation

Make sure you are clear on the intended outcomes of the programme. Understand the reason for undertaking the work, resources available, activities to be undertaken or resources created. Are the intended short, mid- and longer-term outcomes/impacts clear or well defined?

## What to monitor and evaluate

While there are a few generic indicators that may be monitored in a project, these offer limited value in terms of real impact. Project-specific indicators linked directly to identified outcomes provide best value.

Both quantitative and qualitative data can be used to monitor and evaluate a programme.

It is important to recognise the difference between what is an output and what is an outcome. An output is something that has been done, such as an activity, or created, such as a tool, as a result of a programme. An outcome is the effect that the outputs have had (refer to Table 1).

## CONSIDER THIS...

### When developing monitoring requirements:

First, define the current situation, beliefs and perspectives.

Monitor to identify the following:

- change in actions;
- change in outcomes;
- change in beliefs;
- change needed to the programme; and
- unexpected factors contributing to attitude and change.

Make sure you choose a monitoring timetable that suits. Recognise timing might be different for every project.

M Casey

**Table 1: Examples to show the difference between outputs, outcomes, measurement and methods**

| Output | Outcome | Measurement | Method |
|---|---|---|---|
| **A new collaborative network formed** | Strong and trusted relationships developed within network from previously fractured group. | What strong and trusted relationships have developed within the network? | Annual feedback from key network members using face-to-face interviews, questionnaire or survey. |
| **Workshop organised and undertaken** | Increase in awareness and intention to change behaviour or practice leading to actual change. | What awareness has changed?<br>What are current intentions and how do they compare to pre-workshop?<br>What actual behaviour change has occurred?<br>What factors influenced attitude and behaviour? | Feedback sheets at workshop to indicate awareness change in the short-term.<br>Follow up with a phone questionnaire or online survey with participants to establish adoption and practice change. |
| **New tool created** | Improved practice or cost savings for participants as a result of using the new tool in their business, such as database, budget or App. | Have participant's been seen to or known to use the tool.<br>Have participants improved understanding, made changes to practice or savings by using the new tool? | Evaluated as downloads or purchase of tool.<br>Follow up phone or online survey to assess participant's estimates of cost savings due to adoption. |
| **Field day** | Increase in awareness.<br>Understanding of the context for application.<br>Awareness of features of the practice and possible outcomes/benefits. | How do participants recognise the new technology?<br>What do they perceive to be the outcomes and benefits of the proposed behaviour change?<br>What did the field day add to the context for the participant?<br>What ideas for action do they have? | Feedback sheets at field day to assess ideas and thinking.<br>Survey to indicate awareness and intended change in the short-term.<br>Follow up with a phone questionnaire or online survey with participants. |
| **Newsletter** | Repetition of messages.<br>Detail that imparts important or more in-depth information.<br>Important and timely reinforcement of messages.<br>Follow up on questions raised at field days or workshops.<br>Permanent resource. | How much change in awareness or intention to change behaviour has occurred?<br>What are they doing today that differs from what they did previously? Why? | Spikes in enquiry, website hits and other contact following newsletter publication.<br>Direct contact with recipients to assess awareness of newsletter-specific content.<br>Recognition and reward for newsletter-specific activity.<br>Longitudinal survey of readers. |
| **On-farm demonstration – a programme of visits over time** | Awareness and knowledge of the seasonal nature of benefits/outcomes.<br>Building realism – benchmarking of participants' expectations with reality over time.<br>Building confidence through shared experiences and observations.<br>Allows participants a longer timeframe to assess and consider options. | How much has their perception of benefit changed over the programme of visits?<br>What new questions or concerns do they now have?<br>How comfortable do they feel about their ability to engage with the technology?<br>How confident do they feel about engaging in discussion around the features and benefits of the technology?<br>Who would they be willing to recommend the technology to? | One-on-one survey of attendees.<br>Focus group interview. |

# 5 HOW TO DELIVER

## Making a difference every time

Below are some questions to ask yourself about your extension programme based on the information discussed in this handbook.

| Questions to ask to develop a successful extension programme | Tips to consider |
|---|---|
| What's in a name? | Be smart in naming your project. Understand the value of a project name that distils the key message and helps with project recognition, for example, Lucerne4Lambs. Be prepared to adopt the name that others use to refer to your project by, for example "four-day shifting" rather than "ewe winter management". |
| Can you clearly describe your objectives? | Be able to explain the key objectives clearly and simply. The way you explain your objectives needs to appeal to the participants of your programme (not the funder or science body). |
| Who are your audiences? | Identify your audiences and the best ways to communicate with them. |
| Who are your friends and foes (gatekeepers and influencers)? | Think about who influences the adopter's thinking and how these influencers might support the desired behaviour or practice change. At the same time, consider any gatekeepers who might limit behaviour or practice change. |
| Who are potential champions? | Think about credible, influential advocates for your programme and ways to tap into their support. |
| Can you align the programme with the work of other groups or experts? | Aligning the programme with the work of other groups or experts (for example, scientists, regional council, Fish and Game) means that data, lessons, and key messages are integrated into their expertise and initiatives. This approach ensures the programme has momentum beyond the funding. |
| Does your programme have scientific validity? | Retain links with the source of work (for example, the science provider) to ensure it maintains its scientific validity. |
| How will you communicate information? | Enable easy, regular and effective communication. Develop communication channels at the beginning of the programme where information, key messages and fact sheets can be held. This will enable information to be available beyond the life of the programme. Communication channels might include websites, email newsletters, and Facebook. As part of your communication, repeat the messages, send links embedded in newsletters, point your end users towards the information as often as possible. |
| Is information easily accessible? | Share the information available. Technology savvy early adopters will access information on their own. Holding on to information can be one of the greatest barriers to rapid uptake. |
| How will the programme's outputs be delivered? | Plan potential delivery of outputs – on-farm demonstration, planned field days, website, Facebook, Twitter, texting. Farmers are rapidly moving to smart phone technology and bypassing the desktop. Use this by formatting your information to suit, such as establishing a Twitter feed or texting field day reminders and website links to participants. |
| Are programme outputs beneficial to the participants? | Programme outputs must be credible, repeatable on-farm, have a cost benefit, be better than the status quo, and be simple. |
| Are you prepared for resistance? | Expect resistance and understand what causes it. |
| Are there any red flags? | Identify red flags early. Issues may be raised through early feedback provided by end users. |
| Can you answer the question "So what"? | Be critical of your own planning or project and be able to respond to the question "so what" with a statement of the likely impact of the proposed programme or technology. |

## The challenge of engagement

One feature that every extension programme faces is the gap between the initial level of engagement with an audience, and the ultimate level of practice change or behaviour adoption and realisation of benefit within the community. The level of attrition, as people slip away from the programme, will be influenced by the extent of initial targeting of potent adopters, and the relevance, benefits and manageability of the technology and learnings, illustrated in Figure 4.

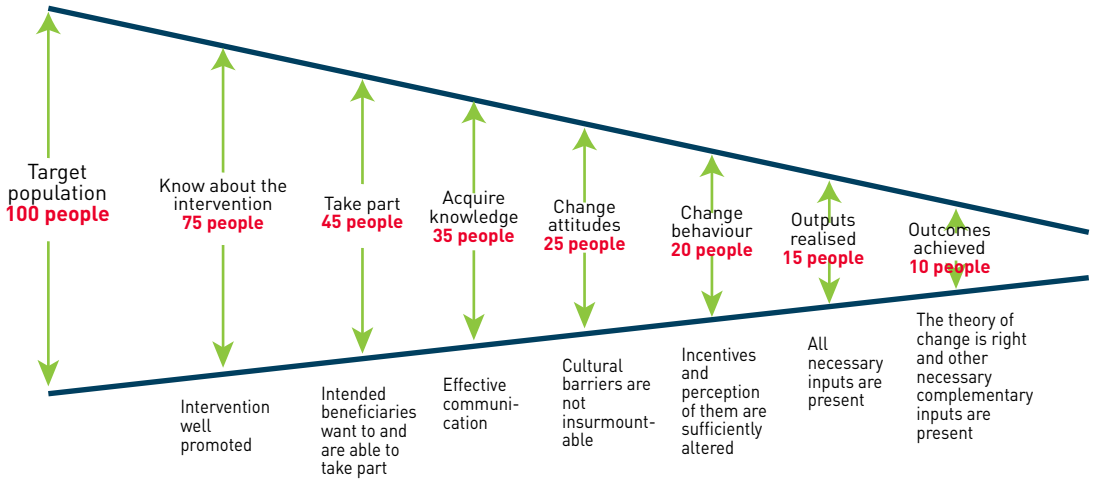
From a target audience of 100 people how many know about your project, take part, change attitudes or behaviour or achieve significant outcomes?
Collecting data at various points through an extension programme will help with understanding effectiveness and identifying weak points in the programme.

This slippage at each aspect of engagement applies at all levels of your extension programme – across the whole community group, down to the attendees at a workshop, field day or course.

If you have a low turn out for your programme ask yourself the following questions:

- What are the reasons no one knows about the programme and why have the attempts to reach the target group failed?
- Did the programme team use promotion and activities geared to the audience?
- Did the programme team use appropriate language for the audience?
- Did key influencers promote the programme as they said they would?
- Did people know about the programme but didn't show up? What were possible barriers to participation? Does the activity demand an unreasonable amount of time, or is it at a time or place that doesn't suit them?

**Figure 4: The funnel of attrition**




Source: H White – http://www.3ieimpact.org/en/announcements/2013/02/12/using-causal-chain-make-sense-numbers/


- Were influential community members (gatekeepers) speaking out against the programme?
- Is the programme offering something people really just don't want? This would be a serious design failure.
- Did people attend, but didn't develop the knowledge, context, or confidence required, so their attitudes and behaviours didn't change? (Remember, just because programme participants acquire the knowledge they may not change behaviour. It's easy to tell people to eat five pieces of fresh fruit or vegetables a day, exercise more, don't smoke or don't drink, but just giving people information has a long track record of not changing behaviour.)

## Choosing extension activities that best suit your programme

There are many different ways of getting your message across to and interacting with end users. Before you decide on your chosen activity it's important to consider both your target audience and the technology or idea you want to promote. What you want to achieve? Do you want to raise awareness of a new technology or idea or do you

CASE STUDY

### LUCERNE FOR LAMBS
SFF (09/112)

- Multidisciplinary team – planning meetings
- On-farm field trials for three years (supported by the science team)
- Field walks on lucerne agronomy and management – initially with seed company representatives (potential gatekeepers)
- Workshops/field walks with farmers – lucerne agronomy, grazing management, water use
- Annual field days
- Occasional updates (email newsletter)
- Factsheets and PowerPoint presentations
- Development of a website as a resource for project outcomes
- Peer-reviewed papers and conference presentations (NZGA)
- Production of Resilient Farming video on one of the farms (climate change adaptation)
- Publication of the lessons as a booklet – A Recipe for Success

want the target audience to adopt a technology or idea?

There is no one perfect activity as each method will have benefits and disadvantages and typically you will need to use a range of methods in the same extension programme.

The examples from SFF projects below highlight the range of activities and dissemination methods used. Not all were planned at the outset, but developed through the process of monitoring and review of the programmes.

The choice of activity, delivery methods and the tools you can use for getting your message across are important. They range from immediate to longer-term activities, and can focus on the message on the day or longer-term access to the information and learnings from a project.

Choose an appropriate mix of activities, design them well and make sure they are cost effective.

## CASE STUDY

### BEST PRACTICE PARASITE MANAGEMENT
### SFF (07/030)

- Multidisciplinary team – planning meetings (science, farm systems and veterinary expertise)
- One-on-one on-farm visits (discovery)
- Annual follow-up visits – review and reflection
- Occasional updates to participants (email and hardcopy newsletters)
- Workshops – extension to the industry (vets)
- Discussion group visits focused around the participating farms
- Media articles
- TV/video – Rural Delivery
- Peer-reviewed papers and conference presentations (*NZ Veterinary Journal*, WAAVP conference)

**Table 2: Features of different communication/delivery options**

| EXTENSION ACTIVITY | BENEFITS | THINGS TO THINK ABOUT |
|---|---|---|
| **MEDIA RELEASE** | – Low/no cost in expenditure<br>– Stronger, more believable message than advertising<br>– Potential to spread | Must be a story that is newsworthy<br>You lose control of the message – the final article may also include an opposing view<br>Editing can change the message<br>A good media release takes time and thought<br>Coverage (readership) is difficult to target or measure |
| **MEDIA ARTICLE** | – You control the message<br>– Low/no cost in expenditure<br>– Stronger, more believable message than advertising | A good story takes time and thought<br>Potential cost of photography<br>Coverage (readership) is difficult to target or measure<br>Science or key message can be lost in the human interest aspect |
| **FARM FIELD DAY/TOUR** | – Information transfer can be tailored to the property<br>– Science messages can be put into context and related to farmer practice<br>– Participants can sometimes see programme outcomes<br>– Opportunity to customise messages for the audience<br>– Opportunity for two-way communication – Q&A sessions<br>– Opportunity to demonstrate the technology or idea as opposed to people reading or listening about it<br>– Opportunity for people to learn from each other | Usually high cost in time and expenditure (four to five hours plus travel time)<br>Audience limited to those interested and/or easily able to attend<br>Need to consider the distance people have to travel<br>Need to consider the time involved in getting to the venue<br>Is the property a good fit for the topics<br>Group dynamics can take over therefore good facilitation skills are needed<br>Can be difficult to ensure good messages<br>Difficult to evaluate effectiveness<br>Good for creating awareness of the topic/programme with wider community |
| **WORKSHOP** | – More intensive information transfer than a field day<br>– Usually smaller groups (20 to 30 participants)<br>– Usually led by experts<br>– Opportunity to customise messages for the audience – more specific than a field day<br>– More opportunity for interaction and activities to enhance learning or understanding<br>– Participants can work with each other in smaller groups and give specific or considered feedback<br>– Opportunity to demonstrate the technology or idea<br>– Opportunity for people to learn from each other | Usually high cost in time and expenditure<br>Audience limited to those interested and/or easily able to attend<br>Need to consider the distance people have to travel<br>Need to consider the time involved in getting to the venue<br>People may not be used to sitting for long periods of time<br>Group dynamics can be a positive or negative influence<br>Opportunity for problem-solving or other activities and interaction (SWOT analysis, BUZZ Groups, facilitated discussion) |
| **SEMINAR** | – Presented by subject matter expert(s) on a topic<br>– Educational focus – more intense than workshop<br>– Purpose is to deliver information more formally | Similar to above |

| EXTENSION ACTIVITY | BENEFITS | THINGS TO THINK ABOUT |
|---|---|---|
| **CONFERENCE** | – Formal exchange of information<br>– Prearranged<br>– Focused presentations, keynote addresses<br>– Specialised by industry/topic | Opportunity to publish programme outcomes as peer reviewed<br>High credibility<br>Long-lasting outcome<br>Outcomes remain widely available to other interested parties |
| **TEXT MESSAGE** | – Good for reaching a large audience<br>– Good for reminders, alerts or crisis communication<br>– Can be used to direct people to further sources of information (hyperlinks, calendar)<br>– End users can respond | Be aware of the Unsolicited Electronic Messages Act 2007 – spam<br>Will annoy people quickly if overused<br>Relies on an up-to-date database<br>Limited number of characters per text so need to be concise<br>Provided through online services such as TextaHq |
| **FACTSHEET OR HAND-OUT** | – Can provide a background or context for the project<br>– Documentation and delivery of key messages<br>– Information that can be left behind | Accuracy, language and message are all critical<br>Limited word count (you can't say everything)<br>Two sides of A4 per topic<br>All factsheets should have date and author (credibility and timeliness)<br>Can be costly in design time and printing costs if professional services used |
| **EMAIL** | – Still one of the most effective social media platforms<br>– Can reach mass audiences fast<br>– Cost effective and simple to use<br>– Consistent and controlled message<br>– Reaches the recipient directly<br>– Good for information, awareness or instruction<br>– Useful for pushing a message, reinforcement and repetition | Be aware of the Unsolicited Electronic Messages Act 2007 – spam<br>Most interested participants will have access (>90%)<br>Impersonal and open to misinterpretation – care is needed when composing emails – email etiquette<br>Make effective use of the subject line so email stands out and is easy to find (search function)<br>Can result quickly in information overload therefore participants don't receive the message<br>Doesn't prioritise messages (some email inboxes can be set up by the user to do this)<br>Can't generate dialogue or discussion easily<br>Can use tools such as SurveyMonkey |
| **EMAIL NEWSLETTER** | – Uses email database<br>– Advantages as above<br>– Can personalise for each participant which improves likely acceptance of the message<br>– Add hyperlinks to key information sources, such as websites, factsheet, video | Be aware of the Unsolicited Electronic Messages Act 2007 – spam<br>Email newsletter distribution relies on up-to-date database (but so does postal and the cost is much lower)<br>Use MS Word newsletter templates or services such as MailChimp |
| **WEBSITES/APPS** | – Possibilities are endless – can be entertaining and visually snappy<br>– Good for information store, reference and raising awareness<br>– Uses the power of search functions such as Google<br>– Makes the information readily accessible to a wide audience over a very long time<br>– Web stats shows who is reading and how, keywords used, time spent on site (Google Analytics) | Access to the internet is improving but keep websites simple and fast for effective download<br>Relies on people seeking out information<br>Can be either costly or cost effective (bespoke websites or free or low-cost templates such as WordPress, Squarespace)<br>Cost of domain name, web hosting and maintenance are ongoing<br>Need some understanding of the technology (or support) to use effectively<br>Time will be required to add information, update and keep websites current and relevant |

| EXTENSION ACTIVITY | BENEFITS | THINGS TO THINK ABOUT |
|---|---|---|
| **VIDEO** | – Creative and entertaining<br>– Can show real people talking about their experiences<br>– Can show a real experience as it happens<br>– Can show proof of progress<br>– Makes people and places accessible for a mass audience<br>– Consistent, controlled message | Potentially expensive if using external expertise<br>Can look amateur if attempted yourself<br>Needs to be well planned with a clear message<br>Talking heads alone are rarely engaging. The most effective videos are very short (see YouTube) – two to three minutes perhaps<br>Be aware that via the internet people are unlikely to watch long videos or those on complicated topics<br>Dissemination of video can be a problem – is it for a workshop or seminar or to be via YouTube (different level of video needed) |
| **WEBINARS (WEB CONFERENCING)** | – Opportunity for experts to reach engaged audiences with a consistent message in real time<br>– Opportunity for two-way conversation – Q&A sessions<br>– Can be delivered to a specific audience<br>– Webinars stay available so can be re-accessed and watched later (with no interaction) | May be expensive<br>Will take practice with an experienced facilitator to develop an engaging webinar<br>Need good (PowerPoint or other) slides to speak to<br>Preparation and practice<br>Need the right technology in place on both sides; however, this is often quite easy to set up and use for the attendees<br>Location needs to be considered (noise levels) |
| **DISCUSSION GROUP** | – Local focus<br>– Members are invested in the success of the group and tend to remain for a long time<br>– At a different host farm each time<br>– Ability to revisit farms to assess progress and challenges is a key feature<br>– Provides opportunity to observe behaviour or practice change in a group over time<br>– Incorporates a systems approach | Involves organising members of the group to host events.<br>Need to be regular to be effective (6 to 12 times a year)<br>Facilitator time involved planning the day with the host member<br>Trust and confidentiality are important<br>Sharing of information is important (often including financial as well as production data)<br>Openness to new ideas and prepared to accept being challenged<br>Ensure all the participants have the opportunity to speak (don't let some members be dominant)<br>Can add visiting experts, activities such as buzz groups, SWOT analysis to the programme<br>Use any time on farm to see something of specific interest<br>Provide informal time |
| **FIELD WALK** | – Common in arable or agronomic programmes<br>– Usually led by technical expert<br>– Take the group to see the crop/ pasture at specific times, for example, establishment and key growth stages<br>– Open Q&A around any issue | Provides a timely focused opportunity to answer very specific detailed questions<br>Questions and topics mostly driven by the participants<br>May be targeting specific groups of participants, such as farmers and growers, technical representatives, or retail and sales |

| EXTENSION ACTIVITY | BENEFITS | THINGS TO THINK ABOUT |
|---|---|---|
| **MONITOR FARM/FOCUS FARM** | – To follow improved productivity and profitability of a particular farm (or set of farms)<br>– Set up for 3–4 years to capture the time required to even implement a change<br>– Uses a facilitator and a community group to support the programme<br>– Develops a loyal audience that attends over the term of the monitor farm<br>– Enables additional expertise to be brought into the programme<br>– Allows a systems approach to be used | Choice of farm/farmer needs to match the programme objectives:<br>– a high-performing farm as a showcase or challenge to other farmers<br>– mid-performing farm where improvements are seen over a period of time<br>Facilitator and farmer need to work well together for a monitor or focus farm to work<br>Farmer and facilitator need to agree on workable goals and objectives that will be sustainable in the long-term<br>Need to make sure you don't meet all key objectives in the first year |
| **DEMONSTRATION FARM** | – Much like a monitor farm but set up with a specific technology transfer objective<br>– May not consider the whole farm system | May expect considerable changes to the status quo<br>Challenging to the farmer<br>Resources may not match expectations<br>Likely to be much more costly to deliver<br>Outcomes may be more property or technology specific |
| **SOCIAL MEDIA** | – There is a growing list of tools to use in this space<br>– Cost effective, interactive and engaging<br>– Wide audience reach<br>– Includes email, email newsletters, websites, video, webinars and text as above<br>– Facebook, Google+, LinkedIn, Twitter, Instagram and Snapchat, ResearchGate, podcasts, blogs | Need good planning and implementation to use effectively<br>Easy to use both badly or ineffectively<br>Easy to share photos and comments via forums such as Instagram and Facebook<br>Enhanced by increased numbers of smartphone users<br>Free to access many of these platforms<br>Open source software so its tested and updated by millions of users<br>Much of it is very easy to use once you have started<br>May have negative connotations that need to be overcome (privacy issues, perceptions of who uses these platforms such as Facebook)<br>Blogs are difficult to use effectively, they are good for raising questions and open discussion<br>Blogs are harder to mediate and are easily "hijacked" by dominant users<br>With poor or no mediation they can focus on opinion rather than fact |
| **ONE-ON-ONE** | – Often seen as fastest and most effective method of adoption of a new technology<br>– Can be used to provides lots of information for project team and end user<br>– Builds a relationship between project team and end user<br>– Provides opportunities to reassess the aims and structure of the project<br>– Helps the end user re-tune and overcome barriers | Costly both in time and money<br>Needs many experts to be effective<br>Direct transfer of required information to the end user<br>Very clear message and in the right context<br>Requires a lot of commitment by the project team<br>Requires a lot of commitment by the end users |
| **SHORT COURSE OR FORMAL TRAINING PROGRAMME** | – Structured technology transfer<br>– Often with trained professionals, leaders or tutors<br>– May receive a qualification on completion | Similar to above |

## Design and delivery

### Facilitation and presenting

These are two different skills. There is a wealth of information available on how to deliver a good presentation, improve your presentation skills or what is required to facilitate. What follows is designed as a brief summary and a pointer for what you need to consider.

### Requirements for a good presentation

Deliver a good presentation by taking the following steps.

- Know your subject and be prepared. If you use a PowerPoint presentation make sure you know the slides inside out (see PowerPoint presentations discussion on page 35 for more tips).
- Speak with confidence, loud and clear. Don't speak too quickly; avoid the race to the finish.
- Maintain eye contact with the audience and be prepared to engage with audience questions.
- Plan your presentation, focus on the key messages and remember to reinforce the take home message (they may only remember the last thing you say, especially if there has been a series of speakers).
- Make sure you are comfortable with your style of presenting – for example, novice presenters may find a structured talk much easier than a Q&A style presentation with a whiteboard.
- Practice, practice, practice. As part of that, time your presentation in advance.

### Requirements for good facilitation

The facilitator's role is to guide the process not be the fount of all wisdom and knowledge. Essentially, their role is to ease the process, similar to chairing a meeting. This means the facilitator isn't there to give opinions but to draw out the opinions, knowledge and ideas of the participants. It can actually be very difficult to both facilitate and participate in a meeting or workshop.

**Guidelines for an effective science presentation (source: AgResearch report to Deer Research 2014)**

| Sections | What needs to be covered? | % of time |
|---|---|---|
| **Introduction** | **Introduction – defines the problem**<br>– relevance<br>– importance<br>– context. | 5% |
| **The question** | **What is...?** This question creates a definition of the factors affecting the problem.<br>Canvass the audience regarding the question. This may use group brainstorming, individual questioning, or group questioning to get as wide a definition of the factors affecting the problem. | 10% |
| **Technical presentation around the topic** | This presentation should describe "cause and effect" so participants are able to better understand the changes they are being asked to make. | 30% |
| **The second question** | **How do...?** This question creates the solutions to manage the problem.<br>Canvass the audience regarding the potential management solutions. The length of this session depends on time constraints. | 5% |
| **Management presentation and/or discussion** | Putting technical data into practical technologies solutions. This session will involve interaction with the audience to ensure relevance and practicality. | 30% |
| **Outcomes** | What do we do next? This question can be as discussion, or individual by giving time for reflection and is often led by examples from the host farm to get participants thinking. | 20% |

A good facilitator is neutral and never takes sides. At a field day or discussion group the facilitator will ensure all participants have their say and will also summarise topics and lead questions if required.

The facilitator should:

- understand the goals and objective of the meeting, field day, workshop, seminar;
- keep the programme on time and moving;
- involve all the participants including reluctant contributors and control dominant ones; and
- pay attention to verbal and non-verbal cues – bored, angry, disengaged, and disruptive.

## Running a successful field day

Field days, workshops and seminars are a common feature in extension programmes; however, sometimes more thought is given to the venue and the BBQ than the topics, speakers, and facilitation.

The information below will apply to running effective seminars, workshops and field walks also.

### Field day preparation

Make sure there is alignment of technical and practical information during the field day. Facilitator, farmer, science and other expert presenters need to communicate and decide on:

- field day topic;
- practical farm data that may be available; and
- field day farm tour stops that may be used to demonstrate or reinforce the messages from the science.

Agenda setting:

- science or other presentations to be no less than 30 minutes and no more than 1 hour;
- science presentation to be near the beginning of the programme;
- field tour to follow the science presentation;
- day to end early enough to provide social time for participants before departing; and
- the programme should have no more than three presenters.

The facilitator should ensure that the field day is advertised appropriately (this should include email, print and text message) and that local journalists are informed. Facilitators need to make sure a wide range of potential attendees are informed, such as the wider local community and agribusiness (including banks and accountants). Many organisers may unintentionally limit attendance by assuming they know who will be interested.

Presenters should have hand-outs prepared if needed (more than just the PowerPoint printout). The facilitator should aim to capture wider discussion of importance and key messages from the day.

### Field day delivery

The facilitator begins by welcoming participants, acknowledging sponsors, making appropriate introductions (including the host farmer) and introducing the agenda for the day. The facilitator also outlines the purpose or key objectives of the day.

The host farmer may present some information about their enterprise that will relate to the main topic for the day.

#### Formal science presentation

For effective extension, the following guidelines have been developed to ensure audience engagement and participation.

#### Field tour

The field tour needs to demonstrate principles that were presented in the science presentation, or visit sites that raise questions about the implementation of the recommendations. For example, a session that refers to hind body condition may visit the hind herd and explore the practical implications of the current feed supply on the potential to change that condition.

The field tour must have appropriate stops but it is recommended that there be no more than three. If significant travelling time is involved then some sort of commentary via FM radio may be required.

The field tour should be no more than 50 percent of the time available, unless significant presentations are being made during the tour.

#### Post field tour and wrap-up

The final session of the day should create the opportunity to interact with the presentation team and consider financial and practical issues and other topics that develop.

Suggestions on structure of the final session are as follows:

- financial analysis of the opportunities presented

or the progress being made by the host farm in the area of the science presentation;

- buzz group or breakout groups to give participants opportunity to discuss topics in more detail;
- specific questions to both the presenters and farmers; and
- discussion about practical implementation of the recommendations.

A wrap-up by the facilitator should emphasise the lessons from the day. The facilitator should thank the host farmer, sponsors and participants.

Finally a reminder as to where further information can be found – for example, the relevant websites or contact person.

## Other important points for consideration

### Venue

Make sure the venue is appropriate for the purpose. People like to go to a property that is different. It is also important to consider the value in repeated visits (such as a monitor farm or discussion groups) where the audience can assess progress.

If the purpose is to attract a new audience then a venue (farm) that people have heard about but have been unable to visit will attract people.

The venue must be accessible even if the weather turns rough. Check that farm tracks are suitable in wet weather.

If the audience is going to be in the one place for a long period it must be warm and comfortable.

### Setting an agenda

Plan to start your session 15 minutes after the advertised time. This will help mop up the stragglers. The day must finish on time. Participants are busy people and their time is valuable too.

Make sure all speakers know how long they have to present and answer questions before they start. A good facilitator for the day is important to ensure you stick to times allocated. The last speaker must have his allocated time.

Allow time when setting the agenda for some overrun.

Allow plenty of time to socialise. The network opportunity for further questioning and discussion is important. Encourage presenters to stay as well.

Be realistic in setting the agenda: It takes longer than 15 minutes to deliver a cup of tea to 50 people in a woolshed.

It takes almost twice as long to travel around a farm with 20 utes than just one.

### Picking a topic

The programme's topic needs to be topical and relevant to the audience targeted. Don't cover too many different topics; one or two in detail is better than five or six lightly.

### Choosing speakers

Engage experienced (eloquent, credible) speakers that are up to date with the topic. Make sure they understand the topic that they are to speak to and the time allocated.

If there are to be more than two speakers then there may be opportunity to incorporate a "novice" speaker into the programme. Think about succession. Farmers are very tolerant of young and inexperienced presenters provided they are not covering the main topic of the day.

Use experts in the audience. There are likely to be some in the audience with very good knowledge on a topic. Beware of the audience coming to the wrong conclusion when the right expertise is lacking.

If possible have a farmer talk to the topic to emphasise the presenter's message. They must be given plenty of notice.

Speakers need to be seen:

- If the presentations cannot be seen it doesn't matter how good they are the day will be less successful.
- Most modern farm buildings are very bright and difficult to darken; if using visual aids in the field they need to be able to be read from at least 20 metres.

Speakers need to be heard:

- Having a field day stop on top of a hill may give a great view, but may be very windy and make it difficult to hear speakers.
- Repeat questions so that all the audience is clear as to what is being discussed.
- For a big audience consider a sound system or FM transmitter.

### Hand-outs

The participants like to have hand-outs of all presentations available. Note that later it is often hard to relate a PowerPoint printout to the discussion on the day.

Alternately, provide pens and paper so the audience is encouraged to take their own notes. A much better learning option than a hand-out.

Consider how much value there is in spending time preparing a standard hand-out (such as farm type, stock numbers) and what attendees will get from it.

Instead consider what messages you want to deliver after the field day. This is a key opportunity that is often overlooked to summarise the key messages from the day and to answer any questions raised in more depth. This may be a better option.

### Field day evaluation

When preparing an evaluation consider the following questions:

- Why are you evaluating the field day?
- How are you going to use this information?
- What in particular are you going to evaluate and why?
- If you do evaluate make sure to give participants the opportunity to tell you what they didn't like – it's a great learning opportunity to improve your field day planning.
- Participants contact details – important for a follow up survey to see if they made changes, any barriers, or challenges.
- If you do not have a clear reason for how you will use this information, ask yourself if you should be carrying out the evaluation.

### PowerPoint presentations

We all recognise a bad PowerPoint slide:

- too much text;
- text is too small;
- bad graphics;
- poor contrast; and
- too many features used on the slides (such as fading).

So instead:

- use the programme and its features;
- take note of the heading options and sizes, bullet points, spacing and font size used in the templates (a 2.5 centimetre letter on the screen can be read easily from 3 metres – about 24 point minimum for content, larger for headings);
- pick an easy to read font (Helvetica, Arial, Tahoma) and restrict the number of fonts to one or two (no Comic Sans); and
- don't use all the space –
  - › leave white space between lines of text;
  - › use big borders (in case the presentation doesn't fit the screen).
- be careful with colours – they can ruin a presentation (again check the template suggestions for colour mixes);
- for graphs and tables – use bold lines, good contrasting colours for lines on graphs, simple

tables that are easily read and understood, one figure or table per slide;
- black on white will always be easiest to read, if boring – keep good contrast in mind if you change colours;
- keep it simple – keywords only, no sentences, learn your presentation (don't read your slides);
- use good pictures where they enhance the message in preference to text;
- avoid bullets if possible (they are a default in PowerPoint but they don't have to be);
- be careful if you are going to use animations, cartoons – it may not match audience expectation;
- keep the number of slides to a minimum: 8–10 slides for a 15 minute presentation;
- one message or image per slide, aim for no more than 6 lines (6 words per line);
- always check the spelling and grammar;
- always check that numbers add up, someone in the audience will; and
- don't forget the take home message – make it stand out.

## Follow-up activities or outcomes

### More than just another handout!

There are new tools that are appearing that we can use effectively and cheaply to ensure our key messages stay available. The prevalence of smartphones, all with cameras, provides lots of opportunity. It is important to be aware that new skills are required to use these effectively and this can be time consuming and costly. However, similar effort and consideration is needed if preparing handouts, PowerPoint presentations, publications or media articles.

**Electronic media such as email, websites, and Apps**

- **Email –** Research has shown that email is still widely used and a good format for reaching an audience. It allows you to push your message out (repetition). Use of email newsletters and embedded links to continue keeping the messages in front of audience is important.
- **Websites** – there are free website templates that you can use to easily build a website. Buy a relevant domain name to match the programme and use the power of internet search for access to your programme. A website is the most accessible way to host all the outcomes of a programme, for example, http://www.deerfarming.co.nz.
- **Apps** – Building an app may be the best way to deliver key outcomes (for example, the DeerFeed App – www.deerfeed.co.nz ). This app allows farmers to access complicated science via a very simple app and hence make a better feeding decision.

**Social media such as Twitter, Google+, text messages, Facebook, LinkedIn, Instagram, Snapchat, and blogs**

There is a learning curve for these tools but they are increasingly prevalent and can be very valuable. These all have a role in communicating with your audience and allowing real-time feedback. All have their pros and cons but here are a few options of how they can be used in an extension programme:

- texting – broadcast text the field day date, time and location, reminders;
- text relevant updates;
- Twitter – it's free, easy to use, same options as texting, can add photos, anyone can join;
- Google +, Facebook, LinkedIn – free, can create private pages, easy to share latest news, create user groups; and
- Instagram and Snapchat – opportunity to share photos such as pasture conditions, plant diseases.

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# GLOSSARY

There are some terms used in this document that may be unfamiliar in this context, so definitions have been provided for clarity.

| | |
|---|---|
| **ADOPTER** | The person, or entity, who will take from your programme knowledge, skills or technology and use this in some aspect of their life or business. Also referred to as potential adopters. May be interchangeable with beneficiary. |
| **ADOPTION** | The uptake or embracing of new ideas or habits; to choose for oneself. |
| **ADAPTATION** | The modification or adjustment to improve something; or the process of change over time to become better suited to a situation. |
| **APP(S)** | A self-contained programme or piece of software designed to fulfil a particular purpose; an application, especially as downloaded by a user to a mobile device. |
| **BENEFICIARY** | The person or entity who will gain a benefit from the application of the knowledge, skills or technology you are extending. The benefit may result directly from that person having adopted new behaviour – a direct beneficiary. Or the benefit may result from the actions of adopters having a flow-on impact or benefit for others, for example, seed merchants and agricultural contractors benefiting from the action of adopters planting new forages. |
| **CO-INNOVATION** | A process involving significant collaboration between key stakeholders, using a range of knowledge and skill bases to research, develop and implement a fit-for-purpose knowledge/outcome. |
| **EVALUATION** | To assess or determine the merit, significance or worth of something – a programme, a project, a policy, a product or a one-off event. |
| **EMERGENT PROPERTIES** | Unexpected behaviours that stem from interaction between the components or parts of an application and their environment (farm system). Emergent properties can be beneficial or not; users adapt a product or process for alternate use (an example could be the use of pregnancy scanning to refine stock management). |
| **EXTENSION** | To promote adoption. A process for enabling change in individuals, communities and/or industries involved in the primary industry sector and with natural resource management. |
| **EXTENSION STRATEGY** | The plan for achieving the desired uptake of knowledge or technology and behaviour change in potential adopters. |
| **GATEKEEPERS** | People, entities and agencies that can limit information pathways, attitudes, and values amongst potential adopters, and also influence thinking and behaviour amongst other influencers and advocacy bodies. |
| **HABIT** | Behaviour that has become automatic, rather than repeated behaviour. Habits can be used to explain why people's behaviour is often not in line with their intentions. |
| **INFLUENCERS** | Positive influencers (advocates) are people, entities and agencies that can assist and enhance information pathways, attitudes, and values amongst potential adopters, and also influence thinking and behaviour amongst other influencers and advocacy bodies. Negative influencers are people, entities and agencies that have the potential to disrupt and derail ideas and programmes. |
| **INNOVATION** | Introduction of a new ideas, devices or methods or to incorporate something new into business practice. Simply put, innovation is about doing something different not doing the same thing better; it is significant positive change. |

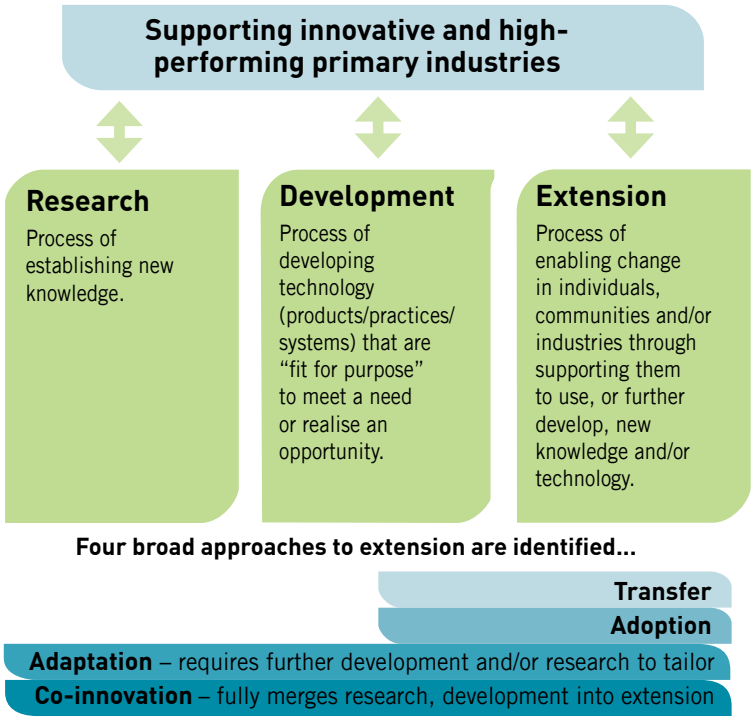
| | |
|---|---|
| **INTEGRATOR** | The person who can put together parts or elements and combine them into a whole, to bring together the parts required for a project (ideas, research and issues). This is where the role of integrator (also referred to as "listener") is important in identifying where the process may be falling short of the adopters' expectations. |
| **KNOWLEDGE BROKER** | People who act to enable stakeholders to answer their own questions and act based on the best possible knowledge and information. |
| **LIKELY PARTICIPANT** | People at all levels who your programme might reach. Ranges from adopters and beneficiaries though to gatekeepers, influencers, researchers and extension workers. |
| **MONITORING** | Systematic data collection to check progress and for use in decision-making and planning. |
| **PROGRAMME** | The whole programme from research and development, evaluation, extension through to monitoring and review. |
| **SYSTEMS THEORY** | Studies relationships of systems as a whole. Systems with a large degree of interaction between individual elements are likely to behave in unpredictable ways. They are often recognised by the influence of feedback loops that reinforce current behaviour or practices. The potential is to design interventions that can disrupt existing feedback loops and then establish new patterns of attitudes and behaviours. |
| **SYSTEMS THINKING** | The art of simplifying complexity, seeing through chaos, managing inter-dependency, and understanding the variables involved in choice. Also described as the art and science of handling interdependent variables instead of just looking at the independent sets of variables (Gharajedhaghi, 2004). The components of a system interact to create effects that they could not have been generated singly. |
| **TECHNOLOGY** | A product, system or practice that meets a need/realises an opportunity; that has been developed to be "fit" for a specified purpose. |
| **TACIT KNOWLEDGE** | Personal knowledge embedded in individual experience and involves intangible factors, such as personal beliefs, perspective and the values system, and contains such things as subjective insights, hunches and intuition. |
| **TECHNOLOGY TRANSFER** | Commonly referred to as an extension programme or behaviour change programme. The straightforward uptake of already available knowledge or technology into current practice. |
| **SELF-EFFICACY** | The extent or strength of one's belief in one's own ability to complete tasks and reach goals. This can be seen as the ability to persist and a person's ability to succeed with a task and therefore is a key component in developing adoption and behaviour change programmes. |

# APPENDIX 1: MPI EXTENSION FRAMEWORK

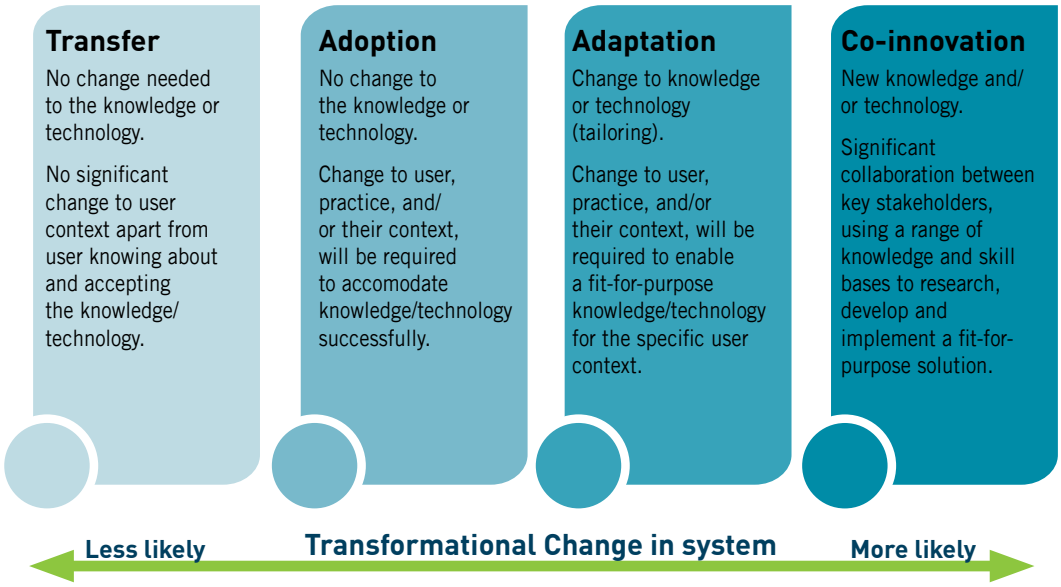
MPI has developed an extension framework as a way at looking at the different types of strategy that may be needed in an extension programme. This can be helpful in describing the different levels of complexity in both the technologies to be adopted and the systems in to which they will be adopted.

Within any programme, however, there is likely to be facets of transfer, adoption, adaptation and co-innovation, as described in this framework, as different audience groups, different components of the technology, and even different time sequences of the extension programme are designed and developed.

**Requirements to support innovative and high-performing primary industries**




**Achieving transformation change in systems**



**Approaches to sharing information**

| Transfer | Adoption | Adaptation | Co-innovation |
|---|---|---|---|
| **Appropriate if the focus of the extension:**<br>– is known and wanted by target audience;<br>– simple or easily understandable to target audience (often an improvement on existing knowledge/ technology); and<br>– requires no (or minimal) change to user context for successful embedding. | **Appropriate if the focus of the extension:**<br>– is wanted or needed by target audience;<br>– is relatively simple or clearly links to current knowledge/technology already in use;<br>– requires changes to be made in the user context (for example, change in attitude, practice, product use, or system setup); and<br>– has impacts that are easy to see and reversible. | **Appropriate if the focus of the extension:**<br>– is largely unknown to or not well understood by the target audience;<br>– is complex/includes multiple ideas/ technologies working together<br>– requires tailoring to ensure fit for purpose across different contexts;<br>– requires changes to be made in the user context (for example, change in attitude, practice, product use, or system setup); and<br>– has impacts that are significant and are able to be argued as a clear priority for the user or other key stakeholders (often impact is not easily reversible). | **Appropriate if:**<br>– there is no clear problem definition; and/ or<br>– existing knowledge and technologies are not suitable for use and the nature of change:<br>– impacts on a range of stakeholders/ communities<br>– is very complex and/or has conflicting drivers<br>– has significant system-wide implications<br>– requires exploration and critique of current assumptions, outcomes<br>– requires new research and/or development work to solve problems or realise aspirations fit for most/all stakeholders involved. |
| **Minimal support required.**<br>Support should focus on:<br>– effective communication of availability; and<br>– providing a means of access. | **Medium level support required.**<br>Support should focus on:<br>– enabling user to identify changes needed to their specific context;<br>– trialling, monitoring and modifying as necessary<br>– providing adequate technical knowledge;<br>– understanding and working with user's current attitudes, values, knowledge and practices; and<br>– understanding and working with user's contextual constraints and opportunities. | **Significant level of support required.**<br>Support should focus on:<br>– the establishment and maintenance of a network that allows a range of stakeholders to effectively work together<br>– may require additional "brokers";<br>– ensuring expertise from all key stakeholders (including tacit knowledge) informs "tailoring" decisions;<br>– employing strategies to ensure attitudes, values, current practices, contextual constraints and opportunities are understood by all stakeholders and these understandings inform key decisions; and<br>– decision-making is informed by monitoring and evaluation. | **Extensive collaboration between a range of stakeholders required.**<br>Collaboration should provide:<br>– opportunity for stakeholders and "brokers" to work together to create effective networks;<br>– access to a range of knowledge and skill bases including and in excess of that held by stakeholders, to maximise opportunity for innovation;<br>– a culture of trust where valuing of multiple perspectives is inherent and the nature and direction of change is negotiated and agreed;<br>– participatory learning environments where research and development is driven by all stakeholders;<br>– decision-making is informed by monitoring and evaluation; and<br>– opportunity to "extend" resulting knowledge or outcome to wider group. |

# APPENDIX 2: BEHAVIOUR CHANGE THEORIES

| Theory | Key assumptions | Examples |
|---|---|---|
| **Luhmanns' Theory of Social Systems** | Noe and Alroe (2003)<br>This is based on a theory of biological organisation where the system is capable of maintaining and reproducing itself. The farm enterprise is a complex network of biological, technical and social relations that can be reviewed as a self-organising system, with three key elements:<br>– System boundary: division from the external environment with the aim of simplifying and managing complexity. All the factors under the farmer's direct control.<br>– Communication: providing the information that is required to meet the need.<br>– Meaning: the system must exist for a reason.<br><br>This theory acknowledges the overwhelming complexity of available information that the people must interpret to make the system work which is a good description of current technology adoption requirements. | |
| **Individual theories**<br>**These theories are concerned with understanding the factors influencing human behaviour and work on the assumption that individuals behave rationally with the aim of maximising the benefit to the individual (themselves).** | | |
| **Deficit model** | The key assumption is that if people understand and know more about a topic they will act in a rational way, and can be seen as the basis of many adoption and technology transfer programmes.<br>– This top-down model of communication presumes there is a "deficit" in public knowledge and understanding which needs to be "filled" by expert knowledge.<br>– That the provision of knowledge is a necessary step in trying to get individuals to adopt new ideas and technology.<br>– There is a belief that providing more information will change behaviour.<br>– Principles of this model are useful if the aim of the technology transfer programme is to provide information and raise awareness.<br><br>**Limitations:**<br>it does not take into account the end user, or their tacit knowledge; and information alone is insufficient to lead to action. | Climate cloud:<br>– Web-based resource provides information in the form of publish articles on climate change.<br>– It is aimed at farmers and other people interested in learning more on the topic.<br>– All documents are peer-reviewed by experts to ensure the information provided is accurate and knowledge based, it's not merely opinion.<br>– Belief that providing more science information to farmers will change their behaviour. |
| **Rational Choice Theory** | The key assumption is that people perform cost/benefit calculations when deciding to adopt a new technology or behaviour and will act accordingly.<br><br>**Limitations:**<br>Although economic measures are important, and can be effective, attempting to predict people's behaviour solely on economic grounds is not always enough as:<br>– there can be information gaps so people cannot weigh up all costs and benefits;<br>– people are motivated by different things and do not always make decisions based solely on maximising economic benefit;<br>– neglects external influences which can influence decision-making; and<br>– assumes people are always rational and motivated by self-interest. | Commonly used:<br>– Legal punishments – to increase the costs associated with certain behaviours and therefore make them less attractive.<br>– Price signals – taxes or subsides to adjust costs and benefits and therefore encourage or discourage certain forms of behaviour.<br>– Information – to inform people of the costs and benefits of choices and to highlight new and more adaptive behaviours. |

| Theory | Key assumptions | Examples |
|---|---|---|
| **Theory of Planned Behaviour** | To understand intended behaviour it is important to understand the influence of the attitudes, subjective norms and perceived behaviour control of an individual. It aims to predict a person's intention to engage in a behaviour at a specific time and place which is determined by components:<br>– Attitude: degree to which an individual has a positive or negative evaluation of performing a particular act.<br>– Subjective norm: belief about whether most people approve or disapprove of the behaviour. A person's perception of how "significant others" think they should perform or behave.<br>– Perceived behavioural control: belief about how feasible it is to perform a particular behaviour.<br><br>**Advantages:**<br>– assesses the effects of belief in a structured way, and allows for the possibility that an individual may have "mixed emotions" about a specific issue;<br>– facilitates the clarification of the distinctions between different types of beliefs and their respective roles;<br>– identified that attitudes may be based on incorrect beliefs, or misconceptions;<br>– highlights the importance of subjective norms as well as individual attitudes and characteristics; and<br>– provides a conceptual link to interpersonal and community theories of behaviour change.<br>**Limitations:**<br>– assumes an individual has both the opportunity and resources to be successful in performing the desired behaviour, regardless of intention;<br>– doesn't account for other variables that factor into behavioural intention and motivation, such as fear, past experience or habit;<br>– doesn't take into account environmental or economic factors that can influence a person's intention;<br>– assumes that behaviour is the result of a linear decision-making process, and doesn't consider that behaviour can change over time;<br>– doesn't consider a person's actual control over behaviour; and<br>– the timeframe between intent and action is not addressed. | Lapple and Kelley (2008)<br>– To understand the intention of conventional farmers to convert to organics.<br>– Results showed that conversion is affected by attitudes of the farmer, perceived social pressure (subjective norms) and the ability to convert.<br><br>Lynne et al (1995)<br>– To understand water saving technology adoption and technology investment in strawberry farmers.<br>– Results showed that to predict technology adoption researchers need to account for both perceived and actual control of the farmers. |
| **Norm Activation Theory** | This is a framework for understanding pro-social altruistic behaviour, such as farmers placing part of their land into a QE11 covenant:<br>– personal norms are the only direct determinants of pro-social behaviour;<br>– some behaviour is intended quite specifically to benefit another person without regard for social and material reinforcements;<br>– personal norms are influenced by awareness of consequences of an individual's actions and the acceptance of personal responsibility that an individual holds for these consequences; and<br>– strength of these two influences will also influence the link between the personal norm and the behaviour. | Used to look at:<br>– environmental protection;<br>– recycling behaviour;<br>– household energy adaptations;<br>– alternatives to care use. |
| **Model of pro-environmental behaviour** | Sees environmental knowledge, values, and attitudes, together with emotion involvement making up a pro-environmental consciousness. This model is:<br>– embedded in personal values and is shaped by personality traits, as well as other internal factors;<br>– external factors are also acknowledged as influencing behaviour, including, infrastructure, political, social factors and economic situation;<br>– identifies potential barriers to pro-environmental behaviour, such as lack of external possibilities and incentives, lack of environmental consciousness, lack of internal incentives, negative or insufficient feedback about behaviour and old behaviour patterns; and<br>– can help identify potential barriers people may face when deciding to adopt a new technology and can focus on methods to break these down. | – Principles can be used in any extension programme introducing a new technology aimed to improve the environment.<br>– Can be applied more widely to other types of change being induced from beyond the farm gate because of the external forces analysis component. |

| Theory | Key assumptions | Examples |
|---|---|---|
| **Interpersonal behaviour theories**<br>**These theories change the focus from the individual to the shared ideas and relationships to those around them.** | | |
| **Triandis' Theory of Interpersonal Behaviour** | The key tenet is that behaviour is a result of either a rational process involving careful deliberation or from a habitual process, based on how often an individual has undertaken the behaviour before.<br>This theory:<br>– allows for habitual and unintentional behaviour;<br>– habit is the primary determinant in behaviour with both intention and facilitating conditions playing a further role;<br>– recognises the role that social and contextual factors have in forming intentions;<br>– both intention and habit are influenced by facilitating factors which mediates behaviour; and<br>– habit is measured in terms of the frequency of the behaviour in the past but it is activated by a system of cues triggered in response to a situation or environment (described as tacit knowledge). | – Time of day dairy farmers start milking.<br>– When dairy farmers dry their cows off.<br>– Burning plastic.<br>– Fonterra targeting their suppliers to fence off waterways.<br>– Starting and stopping irrigation in spring and autumn. |
| **Social Cognitive Theory** | Emphasises the importance of observing and modelling the behaviours, attitudes and emotional reactions of others:<br>– people learn by observing others around them and modelling their behaviour on what they do – learning can occur indirectly through observation of other people's behaviour and its consequences;<br>– learning by observation enables individuals to acquire behaviour without having to build up the patterns gradually by trial and error;<br>– rewards or punishments influence the likelihood that a person will perform a particular behaviour in a given situation; and<br>– aim of the theory is to explain how people regulate their behaviour through control and reinforcement to achieve goal-directed behaviour that can be maintained over time.<br>Six constructs to this theory:<br>– Reciprocal determinism – the dynamic and reciprocal interaction of people, environment and behaviour.<br>– Behavioural capability – person's ability to perform a behaviour through knowledge and skills. In order to successfully perform a behaviour, a person must know what to do and how to do it. People learn from the consequences of their behaviour, which also affects the environment in which they live.<br>– Observational learning – people can witness and observe a behaviour conducted by others and then reproduce those actions. If people see successful demonstration of a behaviour, they can also complete the behaviour successfully.<br>– Reinforcements – internal or external responses to a person's behaviour that affect the likelihood of continuing or discontinuing the behaviour. Reinforcements can be self-initiated or in the environment, and reinforcements can be positive or negative.<br>– Expectations – anticipated consequences of a person's behaviour. People anticipate the consequences of their actions before engaging in the behaviour, and these anticipated consequences can influence successful completion of the behaviour.<br>– Self-efficacy – the level of a person's confidence in their ability to successfully perform a behaviour.<br>**Limitations:**<br>– assumes that changes in the environment will lead to changes in behaviour;<br>– is based solely on the relationship between a person, behaviour and environment. It is unclear the extent to which each of these factors translate into actual behaviour and if one is more influential than another; and<br>– focuses heavily on processes of learning and in doing so disregards other factors that may influence behaviour regardless of past experiences and expectations. | – Introducing new crops, pastures, practices or technology into a system. Many people watch their neighbour introduce it first and then adopt it.<br>– Demonstrations where people will watch and see the results before adopting a new technology or practice.<br>– On-farm trials by commercial companies (such as fertiliser and seed companies). |

| Theory | Key assumptions | Examples |
|---|---|---|
| **Community or network level theories**<br>**These theories provide frameworks to describe how social networks, groups, organisations or communities function and how this can be used to improve adoption.** | | |
| Social Capital Theory | A key concept is that social networks have value for the people that are in them. People engage in networking and interactions in order to produce a profit.<br>– These networks invest in mutual agreement and recognition to produce outcomes.<br>– These networks can be very formal and organised, such as industry associations, or informal, such as people regularly meeting at a sports club.<br>– The gains are not always positive as social networks can result in destructive or negative outcomes as well. | Examples of social networks or communities:<br>– NZ Grassland Association;<br>– Society of Animal Protection;<br>– Federated Farmers;<br>– farmer discussion groups; and<br>– Monitor Farms. |
| Diffusion of Innovation | This is one of the most well-known theories that aims to explain how and why, and how fast new ideas or technologies spread through communities. It has been widely applied to agricultural examples. There are four main components:<br>– The innovation: an idea, practice or object that is perceived to be new within the context of the adoption.<br>– Communication channel: needed for the innovation to spread. The process people use to share and create information and develop answers to problems.<br>– Time: three key aspects (1) time it takes for a person to go through the innovation process from awareness to adoption or rejection, (2) how early or late in the innovation process a person decided to adopt compared to other members of the network, (3) time it takes for innovation to be adopted.<br>– Members of a social system: people engaged in a network with a common goal.<br>Five characteristics of innovations that can influence whether change occurs:<br>– Relative advantage: Level of improvement of the technology over current practice. Considered the most important influence on the rate of adoption.<br>– Compatibility: Can the innovation be assimilated into the current system? Is it perceived as consistent with the needs, past experience and values of the adopter?<br>– Complexity/simplicity: If too difficult to understand, use or implement a person is not likely to do it.<br>– Trialability: Is it easy to be experimented with as practice changes? The technology may be changed or modified as a person trials it.<br>– Observability: How visible is it to others? This is a key aspect of diffusion of innovation as peer observation is keen as a key factor in adoption. | Many factors used within:<br>– Monitor Farms;<br>– demonstration farm;<br>– workshops; and<br>– seminar series. |
| **Stages of Change Models** | | |
| | Behaviour change can also be thought of as a progression through a series of stages or a process of increasing readiness. It is useful to consider the processes people go through in any adoption programme and take into account that change is a process that occurs over time.<br>– The first stage is pre-contemplation where people are not thinking about or intending to change in the near future. People are usually unaware of the facts or risks of their behaviour.<br>– Second stage is contemplation where people are aware of, and are planning to start, they are considering both the pros and cons equally but may still be considered ambivalent to the idea.<br>– The third stage is preparation where the pros outweigh the cons and people are getting ready to take action.<br>– Stage four is action where actual changes have begun and when a person may give up if they aren't sufficiently prepared for the change.<br>– Maintenance is stage five where sustained behaviour changed occurs and the new practice is intended to be maintained.<br>– The final stage is termination when there is no desire to change back to previous behaviours and the practice is now the new normal. | |

# APPENDIX 3: GETTING YOUR PROGRAMME STARTED

This is a set of questions to help with development and implementation of your extension programme. They are intended as a tool to help in both designing and evaluating your programme and addressing the "so what" issues.

This approach is intended to encourage alternative ways of seeing and acting, aiming to provide you with unexpected possibilities. The reason for this is that conventional solutions don't always work. If they did, the problems we are trying to tackle would probably have been solved long ago!

Not all questions will be relevant for every programme; others simply will not be able to be answered right now because further work or evaluation may be required. Hopefully, they will help you get started with the direction and context for your programme and help identify priorities.

| **Programme vision** | **Quick tips** |
|---|---|
| 1. What do you want to achieve in this extension and behaviour change programme?<br>2. What are the expected key outcomes or innovative ideas?<br>3. How does your project or technology answer any relevant social, economic or environmental question relevant to the industry?<br>4. What research have you undertaken around the issue and possible alternate solutions?<br>5. Have you got a good name for the programme? | **Begin with the end in mind**<br>Conduct a Google search, check SFF website, research papers.<br>Choose a name with a message, with appeal such as Lucerne4Lambs or Focus on Deer. |
| What do you know about the likely participants?<br>6. Who is the target audience for your work/ideas/ technology?<br>7. Whose behaviour or practice do you want to/expect to change?<br>8. Why should they change their behaviour, what is in it for them? | Have the target audience asked for this? Are they interested, are the ready for this new information/ technology? How do you know?<br>**Refer to:** Target Outcomes of a programme. A hierarchy for targeting outcomes and evaluating their achievement – http://digitalcommons.unl.edu |
| Direct beneficiaries<br>9. What are the costs – financial and other?<br>10. What personal and within-business factors are important in shaping their current practice?<br>11. What external factors are important in shaping their current practice?<br>12. What does the new behaviour or practice look like, how will you recognise and measure if you have been successful in enabling change? | Methods for monitoring and evaluating behaviour change need to be identified when you are establishing the goals of your programme.<br>**Tip:** Context segmentation is a tool that you could use to identify your target audience(s).<br>Refer to **Appendix 2: Behaviour change theories.**<br>**Appendix 4: Monitoring and Evaluation methodologies**.<br>Viewing Bennett's Hierarchy from a different lens: Implications for extension program evaluation – http://joe.org/joe/2010december/tt1.php |
| Other beneficiaries<br>13. What other benefits are likely in the wider community?<br>14. How will this benefit private entities? What value will this provide?<br>15. How will this provide a public good? What value will this provide?<br>16. What are the costs?<br>17. Who should/will/or could pay? | Refer to **3 Success.**<br>Refer to **Appendix 2: Behaviour change theories.** |

| Programme vision | Quick tips |
|---|---|
| How do you expect your information or technology to influence behaviour or practice change?<br>18. Why would a person change their behaviour?<br>19. What will influence the rate at which an adopter is likely to implement your technology?<br>20. How will this affect their expectations around benefits?<br>21. What evidence do you have that demonstrates the robustness of your technology and repeatability of the benefits?<br>22. What's the biggest risk that is likely to negatively affect benefits or adoption? | **Tip:** It is very important to understand people's possible motivations for their current behaviour before you start considering how you might influence them to change. Think about this from the outset when planning programme goals rather than at the end. |
| Who are friends and foes – the gatekeepers and influencers?<br>23. Who else influences the adopter's thinking?<br>24. How might these influencers support the desired behaviour or practice change?<br>25. How might gatekeepers limit behaviour or practice change? | Refer to: Gatekeepers in **2 Barriers to adoption.** |
| How well do you know the system(s) into which you expect this technology to be applied?<br>26. What are the (farm) system challenges – the disruption and complexity of current practice? | Refer to: Farm systems in **1 Complex problems and complicated systems**. |
| The team<br>27. Who have you involved to provide a diverse range of people, expertise and experience?<br>28. Who have you involved in this programme to bring a naïve or alternate perspective? | Refer to: **3 The right team.** |
| External factors<br>29. What are the market-based factors that could impact on the technical performance of the technology or attainment of benefits?<br>30. What are the environmental factors that could impact on the technical performance of the technology or attainment of benefits?<br>31. What are the political-based factors (such as local and central government) that could impact on the technical performance of the technology or attainment of benefits? | Refer to: Model of pro-environment behaviour in **Appendix 2: Behaviour change theories.** |
| Life after the programme ends<br>32. What evidence do you have about the timeline a potential adopter will require to move from current practice to effective adoption and realisation of the expected benefits?<br>33. How does this timeline align with your programme intentions?<br>34. What evidence do you have about the timeline to achieve behaviour or practice change by x% of your intended adopters? | Diffusion of Innovation in **Appendix 2: Behaviour change theories.**<br>The ADOPT tool http://www.csiro.au/Organisation-Structure/Flagships/Sustainable-Agriculture-Flagship/ADOPT<br>**Tip:** Define what proportion of the target population should be your priority.<br>Is it really appropriate to develop tools and processes that try to measure everything that might impact, or is the 80:20 rule more appropriate? |

| Programme vision | Quick tips |
|---|---|
| We never have all the answers<br>35. How are you dealing with the issue of imperfect information:<br>› for potential adopters;<br>› for the process of adoption and behaviour change; and<br>› the wider environment in which people are functioning. | |

| Take a rain check | Quick tips |
|---|---|
| How comfortable do you feel about proceeding with designing an extension strategy?<br>1. What are the blind spots?<br>2. Would further evaluation and assessment of drivers of current practice enhance understanding?<br>3. Could a pilot programme, evaluating the technology across a more diverse range of circumstance and environments, clarify benefits and demonstrate the robustness of your technology?<br>4. Would on-farm case studies provide evidence and stories that add to credibility?<br>5. Might further research be required to expand relevance and demonstrate the repeatability of benefits? | **Tip:** If you do not have a clear vision of the extension programme's goals and key messages; the target audience and the behaviour change you want/expect; and how you will measure this change; you are not ready to move to developing a robust, targeted extension strategy. Rather, you need to go back and reconsider the questions above.<br><br>Refer to: **Appendix 4: Blind spot-busting worksheet.**<br><br>Building examples of successful adoption can enhance personal confidence – see self-efficacy section of **Behaviour Change Theory**. |

| Building an extension strategy | Quick tips |
|---|---|
| Designing your extension – champions, advocates and negativity<br>1. Who is/are the programme champion(s) or influencer(s) and what attributes have they been chosen for?<br>2. Who else can you align with and what benefits and risks could that provide?<br>3. Who can potentially be advocates for your programme and the behaviour or practice change you are seeking?<br>4. What will be required for them to become advocates?<br>5. What will you need to do to enable this and when?<br>6. Who will be the detractors and why?<br>7. What will be required to manage their impact and when? | Refer to: **3 The right team.** |
| Designing your extension programme – building awareness<br>8. Who is already aware of your technology, the required behaviour change and the benefits?<br>9. What do potential adopters already know?<br>10. What do they need to know?<br>11. How could this be enabled?<br>12. What do influencers already know?<br>13. How could this be achieved?<br>14. What do gate-keepers already know?<br>15. How could they be converted to become positive influencers of change? | |

| Building an extension strategy | Quick tips |
|---|---|
| Designing your extension programme – how adopters learn and shape their experiences<br>16. What are the most important values, beliefs and experiences that shape potential adopters behaviour?<br>17. What sort of story can you tell around the benefits of this behaviour change?<br>18. How could you enable people to experience the technology and observe changing behaviour as it occurs?<br>19. How will advocates and influencers assist potential adopters?<br>20. Specifically, what additional resources do they need to enable this?<br>21. Specifically, what will be undertaken with the detractors to convert them?<br>22. How can each of the barriers to adoption be overcome? | Refer to: Self-efficacy in **2 Barriers to adoption**.<br><br>If people need to see and experience for themselves, refer to:<br>- outputs, outcomes and methods in **4 Monitoring, evaluation and review**;<br>- running a successful field day in **5 Design and delivery**; and<br>- features of different communication options in **Table 3: Features of different communication/ delivery options.**<br><br>Theory of planned behaviour in **Appendix 2: Behaviour change theories**.<br><br>Consider the range and importance of barriers to adoption – **section 2**. |
| Designing your extension programme – building confidence and experience<br>23. How can you use reflection and reinforcement to build understanding and confidence around the technology?<br>24. How can success be used to build confidence and experience and build evidence of effectiveness?<br>25. How do you plan to track how and understand why people are modifying and adapting your technology? | Consider field trips, farm visits, sequential farm visits to provide real-time experiences – **section 5**.<br><br>Self-efficacy in **2 Barriers to adoption**.<br><br>Farmers sharing stories with farmers – refer to diffusion of innovation in **Appendix 2: Behaviour change theories**.<br><br>**4 Monitoring, evaluation and review**. |

Having answered the questions above you should be well prepared to develop a range of extension activities that will best meet your programme goals.

# APPENDIX 4: MONITORING AND EVALUATION METHODOLOGIES

The following outlines the strategic frameworks, conceptual models and methodology that can be used when planning monitoring and evaluation.

## Strategic frameworks

**Bennett's hierarchy –** this sets out the hierarchical goals of agricultural extension. It can be very useful for clarifying which aspects of a programme to evaluate (see TOPS). Bennett's hierarchy is the evaluation model used in many Australian extension programmes.

**Logical frameworks –** used for both planning projects and moderating activities.

**Owen's 5 forms of programme evaluation –** provides a relevant framework for evaluation stages in agricultural adoption and practice change programmes.

## Conceptual models (next step)

**Action research –** participatory model, evaluating both action and research outcomes. The aim is to use the process of change to contribute to increased understanding of the system and the methods used.

**Participatory evaluation –** where the participants take an active role in directing the evaluation.

**Social impact assessment –** attempts to predict the impact any programme might have on the wider population or distinct groups (this is with respect to long-term effects rather than immediate impacts).

## Methods of evaluation

Many types of evaluation are used such as focus groups, cost benefit analysis, case studies, surveys and questionnaires.

Source: Extracted from Tables 10 to 13, Dart et al 1998.

# APPENDIX 5: BLIND SPOT BUSTING WORKSHEET

Answer the questions below in response to your current decision (Copyright Mind Tools Ltd).

| Question | Response | |
|---|---|---|
| Have you identified, listed and checked all assumptions? | No | Yes |
| Have you identified any myths which are being treated as "facts"? | No | Yes |
| Have you carried out a thorough risk analysis for each option? | No | Yes |
| Have you developed contingency plans to address risks? | No | Yes |
| Have you carried out a cost/benefit analysis to ensure the cost really justifies the benefits (and you are not accepting unreasonable costs just because you are excited about the potential benefit)? | No | Yes |
| If an investment isn't working and your proposed response is to invest more in it, have you considered cutting your losses or changing direction instead? | No | Yes |
| Have you considered all possible outcomes (not just those that you consider the most likely)? | No | Yes |
| Are you weighing all evidence equally (and not giving more weight to data which supports your gut instinct)? | No | Yes |

| Question | Response | |
|---|---|---|
| Are you ruling out any options because they involve breaking a "research or industry taboo"? | No | Yes |
| If an investment isn't working and your proposed response is to invest more in it, is this largely because you hope that you will eventually be proved right (however unlikely this is)? | No | Yes |
| Do you consider that cutting your losses implies you are incompetent? | No | Yes |
| Are you solely accountable for the decision? | No | Yes |
| Are you assuming that the competition will stay the same if you make a change? | No | Yes |
| Are there any "guesstimates" being treated as facts? | No | Yes |
| If one option has more data relating to it, are you considering that that option has more "votes" and that the data is more accurate than that for other options? | No | Yes |
| Are you in danger of confusing correlation with causality? | No | Yes |
| Are you using anecdotes or strong emotional situations to support a decision, rather than relying on good sample data? | No | Yes |

If you answered "No" to any of these, do the work necessary to enable you to respond "Yes".