



*'Global Vision,
Leadership
and Innovation
in Agriculture'*

Good to Great Extension

Influencing on farm change at pace and scale

Report to Nuffield New Zealand

By Tafadzwa (Tafi) Manjala

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Correspondence concerning this report should be sent to:

Tafadzwa (Tafi) Manjala

Email: tmanjala@gmail.com

Phone: +64(0)274 999 021

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Executive Summary

Knowledge and skill alone does not result in practice change. Verbal persuasion, even well-articulated has low impact. Great extension is about a consistent focus on delivering to farmer needs that are self identified as well as those from gap analysis and doing it in a way that results in practice change.

Seventy percent of change programs fail because we assume people are ready to change. Understanding the stage a person is at on the change cycle helps target effective extension intervention which improves the probability of being successful.

To influence change, at pace and scale, requires a focus on changing behaviour, and to change behaviour we need to change the way people think. Most human behaviour is learnt from observing others. Through observation, one forms an idea of how new behaviours can be performed, and this coded information serves as a guide for future action. Practice change will occur when an individual believes they can be successful (self-efficacy).

Farmers learn best from other farmers and keeping farmers in the driving seat will increase participation and relevance of any extension activity, leading to more change on farm.

Identify barriers and then remove them before trying to change behaviour. Involving the farmers who need to change in the planning of the change initiative and the decision-making makes it easier to identify barriers and enables trust. Making general principles local through role modelling and or good story telling reduces barriers to change.

Breaking recommendations into small change steps helps to make success easy. Following up, and involving gatekeepers (decision makers) of the system are key triggers for change as restraining forces are reduced.

To support self-efficacy any change program requires some one on one and or group peer support as change is often stressful and confidence may be lacking.

Successful practice change begins and ends with a successful partnership. Therefore extension professionals will be more effective by building an ecosystem of partners.

The extension professionals' toolkit needs a change model that guides extension to work systematically through the change process with farmers. It also needs an evaluation framework to measure effectiveness. One model is the See (belief's), Do (behaviours), Get (results) Model. If a farmer is not happy about their results, extension can work with the farmer to review their beliefs which can then be challenged to change their behaviour to improve the results.

Recruiting extension professionals for head (intelligence), heart (passion) and tenure, helps to build trust and credibility with farmers which is important to influence change. Building capability is important in both hard skills (technical) and soft skills (understanding people and relationship management). Persistence is also needed as change happens over time (at least 3 years).

The recommendations outlined in this report operate as interdependent determinants in practice change. These recommendations will not only help extension professionals do their job effectively but also enable them to enjoy their work more while being effective at influencing change on farm.

The aims of this project were:

- To seek out case studies on practice change success
- Identify recommendations on what and how extension professionals (change agents) can influence change at pace and scale when working with farmers

Method

Information synthesized in this report was gathered through key informant interviews during five months travel through New Zealand, Canada, United States of America, Mexico, Brazil, Wales, Scotland, Denmark, Netherlands, Italy, France, Ireland and Australia. People interviewed include farmers, frontline extension professionals otherwise known as knowledge transfer professionals or change agents, managers of extension, funders of extension, other professionals working in change areas outside agriculture. Therefore this report is a product of 20 weeks of interviews and reflection. In terms of scope, the report documents examples of successful practices that lead to change. It deliberately is not focussed on identifying how each country visited delivers extension.

Target Audience

The report is targeted to those who working to influence practice change particularly when working with farmers. I am also assuming that there is a clear link between the organisation's purpose and service delivery strategy, this is critical. A simple yet compelling extension vision and strong leadership of extension are also starting points.

What is extension

Extension is the process of enabling change in individuals, communities and industries.

Introduction

The competitive advantage of New Zealand agriculture rests on the speed and scale that our farming businesses apply proven or new management strategies. From comparisons I made while travelling, backed by comments from people interviewed, New Zealand extension is currently world leading based on the higher proportion of farmers engaged with extension and the industry structure of having science, development and extension under one roof. We cannot rest on current or past success as we are constantly reminded by the dramatic turnaround witnessed in the 2013 America's Cup sailing competition. After leading 8 – 1, Team NZ finally lost 9-8 to Team USA.

Seventy percent of change programs fail because we assume people are ready to change. This project has a focus on how to achieve voluntary change. However similar principles apply to forced change once farmers have worked through the grief cycle, that is, people need to be ready to change.

Psychology pioneer Albert Bandura was my main influence in reaffirming that social role modelling has a prominent role in human thought, affect and action. Practice change is a complex, inherently social, developmental process as individuals construct unique yet malleable perceptions that influence their practice change decisions.

Movement toward behaviour change must be considered as a key step in practice change. An effort that moves a farmer from contemplating new behaviour to gathering information necessary to make the change, shows impact. While change is a challenge to measure, evaluation of extension programs is required to help prove impact.

When I asked farmers what is the single aspect that triggers change in their practices, the common theme in over 90% was “seeing and hearing that it works from another farmer” (this could be via full disclosure or via focus or demonstration farm). This point evolved into a recommendation to **“keep farmers in the driving seat” as the cornerstone to any change process. Secondly it emphasizes the importance of farmer role models**

And

When I asked the same farmers to think about the practice changes they had made that were influenced by an extension professional, the common response was the person has to be credible and we need to trust them.

I then asked a follow up question on how an extension person builds trust and credibility. The common response was they need to have been around for a while (tenure) and have proved themselves through recommending something that has worked well for farmers in the local community. This evolved to a recommendation for extension professionals to “be aware of how they can build **trust and credibility** for future leverage and to **recruit for tenure**”.

Chapter 1

Lessons from Professor Albert Bandura

On the 5th of June 2013, I met with the person who has had the biggest influence on my thinking on practice change, world renowned Stanford University Psychology Professor Albert Bandura. The award winning Prof. Bandura develops and tests change principles. My take home message was that to change people you need to change their behaviour and to change behaviour you need to change the way people think. Bandura also challenged me to always think about how to make general principles local, this means link scientific principles from research done elsewhere to a farmer who is applying them locally.

Albert Bandura discovered the importance of behavioural role models from his work with snake phobia patients. He found that the patients' observation of former patients handling snakes was an effective therapy. The patients in treatment abstracted the information that others, who were like them (not snake handlers or therapists), handled snakes with no ill effects. Bandura proposed the social learning theory in 1977 where he concluded that most human behaviour is learned observationally: from observing others, an individual forms an idea of how new behaviours are performed, and this coded information serves as a guide for future action.

This theory to me explains the success of the New Zealand DairyNZ discussion groups, where there are multiple opportunities to observe behaviour and share experiences. Bandura's social learning theory stresses the importance of observational learning, imitation and observing others.

Bandura's social-cognitive theory is based on the triadic reciprocity model in which behaviour, personal traits and the environment interact. The influence of behaviour,

environment and person depends on which factor is strongest at any particular moment. Vicarious reinforcement and punishment also play a role in determining whether an individual will choose to engage in a behaviour or not.

The caveat, according to Bandura (2013) is that, despite the number of times a person observes a behaviour, they will only engage in the behaviour if they believe they can be successful (self-efficacy). In 1994 Bandura highlighted the importance of self-efficacy and defined it as a person's belief in his or her ability to produce desired results by their own actions. More on self-efficacy on page 34. Bandura described these beliefs as determinants of how people think, behave, and feel.



Tafi and Professor Bandura at Stanford

The 4 ways of developing a strong sense of efficacy are:

1. Social role modelling by others,
2. Mastery,
3. Social persuasion,
4. Physical plus emotional state.

In social role modelling farmers see other farmers like themselves being successful. Mastery is where a farmer achieves goals and overcomes failures thereby increasing self-efficacy. Social persuasion is where a farmer is persuaded by others that they can succeed. This positively impacts their self-efficacy. The fourth way is by a farmer's physical and emotional state which influences their own abilities to be successful in an activity.

Albert Banduras' most famous experiment was the 1961 Bobo doll study. In the experiment, he made a film in which a woman was shown beating up a Bobo doll and shouting aggressive words. The film was then shown to a group of children.

Afterwards, the children were allowed to play in a room that held a Bobo doll. The children immediately began to beat the doll, imitating the actions and words of the woman in the film. The study dispelled the belief that all behaviour is directed by reinforcement or rewards as the children received no encouragement or incentives to beat up the doll. They were simply imitating the behaviour they had observed.

People learn not only from their own experience but by observing the behaviour of others, especially if these subjects are similar to the observer (vicarious). The relevance to the agricultural sector is that farmers identify and align with their peers. This vicarious learning permits individuals to learn a novel behaviour without undergoing the trial and error process of performing it. In farming situations, it keeps them from risking costly and potentially fatal mistakes. An example is regrassing practices or health and safety practices on farm, the observation is symbolically coded and used as a guide for future action.

People motivate themselves and guide their behaviour by the goals, aspirations and challenges that they set for themselves (Bandura, 1986). Long term goals set the course for personal change but are too far removed to overrule competing current influences on behaviour. Short term goals motivate and provide direction for ones' effort in the here and now, encouraging incremental change (Bandura, 1986).

Extension can help increase farmer self-belief through the process of verbal encouragement or story telling of farmers who have successfully achieved the practice change locally. Local examples show what is possible. Linking or signposting the farmer to the local actor(s) provides a farmer with clear next steps to practice change. DairyNZ has formalised this process with the dairy connect part of the farmer network project.

Prof. Bandura shared several change principles and practice processes, such as role modelling farmers similar to the change target farmer. For example, this would involve extension partnering with an older farmer to better influence other older farmers as their experiences will resonate best with their age group (vicarious behaviour). Bandura stressed that extension needs to use multiple examples to get vicarious association of how other farmers have achieved success by telling a story of their pains and eventual gains (Bandura 2013).

We discussed the use of guided mastery where extension breaks down recommendations into small units of change. For example recommendations for a farmer wanting to increase pasture eaten could start with visiting/calling a local farmer who has successfully increased pasture eaten. Similar comments were made by legendary Australian farm consultants Basil Doonan and Neil Lane. Bandura stressed that monitoring and providing feedback (encouragement to improve self-efficacy) are required to keep the momentum of change. Prof. Bandura emphasized the importance of the one on one (1:1) support in the early stages so farmers experience the success which will require less support for future change. This is similar to what we have done well with the DairyNZ Northland Candy Focus Farm and other demonstration work at DairyNZ.

In environmental practices, Prof. Bandura talked about the importance of having community leadership and community owned goals. This is something which I see taking shape with the catchment engagement work being done by the dairy industry organisation DairyNZ. Bandura emphasized the need to involve a farmer leader who has an informed world view of the issues as the best advocate for change. The leader will be more credible and respected as they are from the community. In concluding our discussion Bandura noted that when introducing innovation, the social structure should be in place to support farmers.

After meeting with Albert Bandura, I came across the term interpersonal awareness, which is the desire to understand other people. It is the ability to accurately hear and understand others' spoken and unspoken or partly expressed thoughts, feelings, and concerns. This is achieved over multiple interactions and puts the agent in a position to influence the farmers' thinking and ultimately their behaviour. Stephen Covey's 7 Habits of Highly Effective people are good examples of interpersonal habits, particularly "Seek first to understand then to be understood", and "Synergise".

Science of Behaviour Change

Everett Rogers, a professor of communication studies developed in 1962 an 'Innovation adoption lifecycle' that categorizes the population based on their attitudes to new technologies or practices and seeks to explain how, why, and at what rate new ideas and technology spread through cultures (Page 30). Rogers proposed that there are five factors that can influence whether practice change happens. These are:

1. Relative Advantage – how improved is an innovation over current practices?
2. Compatibility – can the innovation be assimilated into an individual's life?
3. Complexity/simplicity – if too difficult to use an individual is not likely to do it.
4. Trialability – easy to be experimented with as practice changes?
5. Observability – how visible it is to others? Visible innovation will drive communication with peers and networks that in turn will generate more positive or negative reactions.

Several people whom I interviewed suggested extension application of this model could be the key to increasing the rate of practice change. Demonstrating proven innovation through innovators as well as early adopters may influence the rest of the farming population to follow. My view is that this is a great model when wanting to encourage component improvement such as riparian planting or in a specialist group

such as a breeders group, where farmers have similar goals. However it has less relevance for a farm system approach, as early adopters in one area could be laggards in another area. Another weakness of the model is in the area of environmental change where a whole population needs to change. There is the risk of late adopters defining a farming sectors reputation.

Evaluation in extension

Evaluation provides proof of programme impacts, enables continuous improvement of extension activities, and will ultimately contribute to enhancing the reach and participation of farmers leading to on farm change. Measuring the impact of extension is a challenge however evaluation of extension programs is required to prove impact.

Evaluation is an upfront activity in the planning phase of a program. To be able to measure incremental change of an extension program Bennett came up with the Bennett's hierarchy which is a table that maps out inputs to outcomes for extension programs. The hierarchy can be summarised as 'If you have sufficient resources to undertake the right activities, and involve the appropriate people and you achieve a positive reaction it can lead to desirable changes in Knowledge, Attitude, Skills and Aspirations (KASA) which provide the basis for practice change (technology adoption) and hence positive community/industry outcomes'. KASA are the changes that are seen to need to happen in people's heads before they are equipped to make targeted practice changes. See Bennett's Hierarchy on page 33.

Chapter 2 Case studies

DairyNZ Extension.

Farm System Discussion Groups are delivered nationally in each geographic area every 4 – 6 weeks apart. Most groups have a farmer leader (convenor) and a group objective. The host farmer is visited by an extension professional (consulting officer) before the group (lasting from 1 – 3hrs) to collect farm physical and often financial information (consolidated into a 2 page handout) and usually includes a look around the farm. Before the group meeting an assessment of the business is carried out to identify key issues. On the group day farmers utilize the handout in a discussion led by the consulting officer. The farm's individual goals and days focus areas are highlighted to ensuring the relevance of the advice. The group offers recommendations to the farmer and the extension officer provides written recommendations from the group day and from the previsit. Discussion group evidence shows that 66% of host farmers make some form of change soon after a group event and 50% report that they are likely to make further change (Figure 4, page 34). The success of these meetings is based on farm access, openness of both the host farmer and among the other group attendees plus and the capability of attendees. The co-operative nature of New Zealand dairy farmers, allowing other farmers to come onto their farms without fear of losing their competitive edge is a key to the success to the extension programme. Evaluation results on pages 33- 34. Danish farmer field schools (see page 36) use the same approach.

Supported one on one change

DairyPush, a change initiative started in 2007 in the Waikato was driven by farmers and written in a paper by David McCall in 2013. This involved 58 farms in the same geographic area with a goal to increase farm profit against a DairyBase benchmark.

DairyBase is a web based software tool operated by DairyNZ that enables farmers, accountants and consultants to analyse farm physical information as well as financial statements against the farms or other farm benchmarks. A focus farm was the focal point for group extension and the group followed the focus farm through a cycle of farm assessment, business planning, implementation and finally review. Each individual farm was assigned a farm adviser who used a coaching approach with the 58 farmers on their farms between extension events. Profit improved by an average of \$570/ha per business in 4 years (\$60,000 per farm). Participants started below the wider Waikato farm benchmark and ended up at par with the benchmark (Figure 6, page 34). Significant change in profit was realised in year 3. The programme cost an additional \$3,500/farm/year over and above the \$1,000/farm/year extension cost. When asked how much the farmer was prepared to pay for the coach, the response was \$1500 and one of the reasons offered was “we didn’t learn anything new”. This highlights the challenge for extension agencies to showcase their value to farmer clients. Evaluation results on page 34.

Tasmania Extension Australia

The Pasture Plu\$ project was a three-year extension project (2005 – 2008) aimed at improving Tasmanian dairy farmers’ business skills over a range of farm management areas (Lagrange et al, 2009). One and two-day workshops were delivered on soil and fertilisers, animal nutrition, water-use efficiency, and business management. The project learning outcomes were supported by a monthly newsletter and a monitor farm program demonstrating the increased profitability of farm businesses that implement best management practice.

Pasture management workshops offered participants the opportunity to be part of a small group of 6 farmers in a follow up coaching program to reinforce learning. Monthly meetings of participants were held on their farms for up to eight sessions.

These days were designed to take farmers through the application of the key pasture management principles delivered in the workshops under the direction and encouragement of a trained coach. The coaches consisted of leading farmers who had the respect of the community, consultants, milk factory staff and TIA (Tasmanian Institute of Agriculture) professionals. This project was cited by many farmers as the best practice change project in Tasmania dairying due to the coaching approach providing follow up by 4 farmers who received coaching and by the 2 of the coaches interviewed.

Sabido on Edutainment

Miguel Sabido is a world pioneer of edutainment. In 1975, Mexican television executive Miguel Sabido created the soap opera "Ven Conmigo," which means come with me, to entertain and promote adult literacy. The plot centered on the lives of adults enrolled in a literacy class. "Ven Conmigo" was a huge success. The show attracted large audiences and enrollments in adult literacy programs were nine times greater the year "Ven Conmigo" aired than the previous year. After one episode mentioned the national distribution center that provided free literacy booklets, 250 000 people showed up the next day to get their copies and 400 000 enrolled in self-study programs.

Sabido also played a key role in the Mexican demographic miracle taking the birth rate from 3.7% to 2.4%. If the birth rate had continued at 3.7%, the present 100 million people in Mexico would have been 150 million. The Sabido change method is based on character development and plot lines that provide the audience with a range of characters that the audience can engage with (some good, others bad) and follow as they evolve and change. The social learning theory, by Albert Bandura, was one of the elements used - people learn new behaviours from vicariously experiencing the actions of others. Sabido determined that three types of characters are fundamental to successful role modelling by audience members. The first two

types of characters are positive and negative role models. The third type of character is the "transitional character." Sabido empowered women by running a serial drama about a typical, poor young family where the mother was desperate to stop at the three children she already had but didn't know how. Over a period of time, and many melodramatic arguments and tears, the woman sought the advice of other women she knew who had 'miraculously' restricted their family size using contraception. The drama changed people's attitudes about reproductive health, gender equity and family size.

Some farmers consciously believe they are doing a good job so don't see the need to change, related comments were made by farm business consultant Basil Doonan that most farmers believe they are in the top 20%.

The housewives experiment - Changing eating habits during World War II

This story illustrates Lewin's effective change model of unfreezing, changing, and refreezing.

During the Second World War, the American government recognized that changing people's eating behaviour was an essential contribution to the war effort since there was a meat shortage, and meat was needed for the soldiers at war (Wansink, 2002). One of the opportunities was for American citizens to eat offal (variety meat). Margaret Mead and Kurt Lewin led the process to influence people to incorporate these food types into their diet.

Lewin and Mead identified the primary need to reduce consumption barriers 'unfreeze' (identify and minimize or remove disincentives, food seen as animal type food, or for poor people). Critically, they identified the central role of a 'gatekeeper', the housewife. The housewife was controlling a household's consumption through

growing food, shopping and cooking, while at the same time overcoming the prevailing belief that 'the man of the house' determined menus. Initial efforts at behaviour change were directed at this gatekeeper according to Schein in 1968. In the action research project there were two groups made up of housewives for the change stage. One heard presentations (lectures) on the nutritious value of variety meats and why they should try the recipes that were handed out. The second group, attended the same lectures on the topic but also attended a group discussion on the topic, where they could share their thoughts, concerns, reasons for resisting the idea, and discuss recipes with other women who had changed 'refreeze'. Many of the women in both groups made a public commitment to trying the recipes. The follow-up research found that the discussion method—which allowed people to voice their concerns had actually lowered their resistance and was far more effective (70% practice change) than the simple 'telling' approach (3% practice change) in generating long-term change in the housewives' attitude and behaviour. Lewin's notion of the field of forces and how to reduce resistance by surfacing and accepting it was validated.

Gatekeepers were encouraged to attend social gatherings where they were shown how to prepare and present a meal from the 'rejected' food and shown that it tasted good. These gatherings facilitated their communication relating to rejected food such as liver amongst their peers, friends and neighbours (their social networks). Lewin described the stronger effects when people participated in discussion groups rather than simply receiving information through a lecture. The effects for participants of the discussion groups did not decrease with time. Lewin concluded that experiencing new foods with a group and hearing the response of others first hand was the most effective way of introducing a new behaviour. These findings are supported by farmers when group discussions are compared to individual instruction and is similar to Bandura's findings.

The lessons for extension are to identify, then remove barriers before trying to change behaviour. Influencing social networks through vicarious role modelling at discussion groups or demonstrations to display social norms and change the acceptability of behaviour are successful and viable methods to achieve behavioural goals.

In extension, there is a need to involve the target farmers in both the planning of the change initiative and the decision-making in that process for the process to be effective. This is consistent with Banduras point about the importance of having community leadership and community owned goals.

The role models we link learners to once they are unfrozen should be able and willing to help direct learners. For change to remain stable it must be "refrozen." The DairyPush change model could be summarised as farmers were unfrozen, changed then frozen again.

Gatekeeper involvement is emphasised in my recommendation on ensuring decision makers and trusted advisors (especially if they do not attend events) are kept in the loop of any recommendations related to change.

Chapter 3 Recommendations

Recommendations to extension professionals interacting with farmers

1. Keeping farmers in the driving seat is number one to achieve practice change.
 - a. Farmer group goals captured through a participatory process should account for the majority, 70% of any extension delivery plan with 30% driven from the industry body - These are needs that farmers may not perceive but are important, such as sustainability improvement. Needs identified from gap analysis are also farmer needs. Farmers must take part in discovering answers to their problems for practice change and some of these are farmers showing positive deviance (see Pascale on page 39). When extension is a 'demand' driven activity then it is more likely to be effective in building trust and ultimately achieving change.
 - b. Having a selected farmer panel to help guide regional extension programmes. Beef and Lamb NZ regional farmer councils as well as the Australian Bendigo based - Birchip Cropping Group (BCG) are 2 examples of a farmers' panel enabling extension. According to Nigel McGuckian who was involved in BCG formation, BCG is a national leader in farmer-driven, agronomic research and extension. Joe Muscat a farmer involved in a farmer led group commented that participation and uptake is a given for farmer led activities.
 - c. Don't assume readiness to change. Start by asking questions to determine at what stage of the change process the farmer is currently (more see page 30).
 - d. Use local stories of farmers that have successfully applied principles to achieve desired change. Use these stories to inform, enable and motivate people. Link them to resources in the community that will provide them with continuing support and guidance. In biblical times parables were told and most would remember the 5 loaves and 2 fish that fed 5 000 people.
 - e. Make success easy by breaking recommendations into small step actions (units of change) so the early successes which help increase farmer confidence

to tackle next changes and develop trust. Small change steps allow brokering that enables change success.

- f. Having honest discussions with farmers on how their business performance aligns with their goals and local benchmarks. From the gap analysis extension could assist the farmer to set Specific, Measurable, Achievable, Realistic, Time bound, Agreed (SMARTA) goals aligned with the small units of change. Agree with the farmer what success looks like to you both. Farmers will be in the driving seat of their business.
 - g. All forms of farmer group discussion engagement require preparation and must always have a pre-visit to the host farmer. This is to ensure there is agreement on the main areas of discussion (and to not discuss) with other farmers. If there are guest speakers this ensures there is a pre-agreement on key messages and avoids areas where there maybe conflicting messages.
2. Follow up to support and positively influence on farm change. Unless we follow up with program participants to determine behaviour change, we cannot show that our programs are successful. Follow up increases the velocity and scale of impact. David McCall, 2013, (General Manager of Development and Extension at DairyNZ) stated that “providing farmer support for change is important as many issues are farm system issues”. This is a reminder that changing one component of a system may have wider impacts on the farm business. Done well, follow up helps the farmer maintain clarity and motivation to pursue the benefits of changing. As previously outlined, breaking the recommendation into small steps. The initial follow up should be after the first step is likely to be completed and can be done as a phone call. If there is a referral, the follow up could be with the rural professional signposted to. If no progress has been made establish why and decide on next steps. When the change has occurred, acknowledge and compliment the farmer on progress and encourage them to the next step. If there is absolutely no appetite to change, extension agents should not feel

disheartened on a decision of no further follow as no programme is guaranteed to achieve 100% success. In group activity, follow up could be at the next group event. This is an effective way of using the group social network to influence behaviour by peer pressure and environmental support.

3. Ensure that all decision makers and gatekeepers (these include farm owners/partners/advisors) are in the loop of discussions on their client farms with the farmers consent. The average adult needs to hear a message six times before they take action and your call to action maybe the critical sixth voice that enables change. The decision makers may be the trusted advisors. Extension professionals need to establish who these people are prior to or at the previsit. Contact with these influencers helps identify their goals for change on farm so the extension agent can build on this progress resulting in complementary efforts, stronger partner relationships and faster practice change. The Noble Foundation in Oklahoma for example enters into a written contract on expectations with the decision makers and this is a key success factor in on farm practice change. The contract could also be verbal.
4. When making referrals, ensure the best possible recommendation Discuss the services and assistance that the farmer agrees they require and consider options for this. Ensure that you have good knowledge of the service provider that they are able to adequately meet the business and personal needs of this farmer. There is a need to obtain consent to discuss the farmers needs with the service provider.
5. Build systems that allow extension agents to use time on farm to understand the needs, understand the context, identify motivators, passion areas, road blocks, and fears, of the farmer (and less time just collecting data). A powerful question I picked from Phillip Spratt, a Tasmania professional facilitator is 'What are you willing or not willing to give up to achieve your goals?'

Recommendations to managers of extension

1. Recruitment should aim to identify individuals who have:

- a. Empathy and passion for the rural sector and want to be in extension for the medium term. These professionals are likely to build credibility and trust with farmers as they are likely to stay longer in the role. Farmers I interviewed referred to continuity of contact with the same person as key to developing long term trust.
- b. Professionals with practical farm experience are likely to have more empathy and be better regarded by farmers (credibility). Having a practical understanding of the work carried out on farm gives the extension professional a positive opportunity to provide recommendations with a greater chance of on farm change. Professionals without this experience could work with suitable farmers to gain some hands on experience.

The Google recruitment process includes an informal interview step where final candidates meet with someone doing the same role in the organisation. In agriculture an alternate to the Google approach is to take a candidate to an event if they want to be in extension. Interviewing candidates on farm with farmers that understand the extension role as part of the panel also gives insights of candidates abilities in the on farm environment.

2. Extension Training.

- a) Farm system understanding and the confidence to apply principles in an integrated manner is fundamental to an extension agents' capability.
- b) Social science training in skills that help professionals connect as human beings, maintain relationships, understand and influence others and manage and control ourselves is important. In France, advisor training according to Etienne (director of a 6 000 advisor training center), is focused on coaching skills with technical skills in the background. Extension agents need ongoing

social skills training to enhance interpersonal awareness. Enhanced understanding of human behaviour provides a better insight to the reasons behind behaviour and puts extension professionals in a position to influence farmer thinking and ultimately their behaviour, leading to practice change.

- c) Story telling training. Well told factual stories achieve better emotional engagement leading to more change. Long tenure in extension guarantees a rich repository of stories.
 - d) A catalogue of practice change success stories stored in a central place can be used as a team training platform. Future change maybe achieved by extension professionals adapting these stories for use in future similar settings. In Denmark and France extension agent games are successfully used as training resources.
3. Design programs that will meet farmer needs with defined steps to practice change. This is best achieved by planning all delivery programs with content that describes how change will be achieved. An extension professional would achieve this by having a “change model” that guides their work and thinking so that they can work systematically and know where the farmer is at all times. An example of a program for a group focusing on heifers achieving target weights could have steps such as trip to farmers achieving target weights, participatory process to identify what the group is willing to do to achieve targets, agreement on activity such as weighing and running a separate at risk heifer mob, visits to each participants farm and discussion on opportunities to succeed. Designers of tools or products will be more effective when they are involved in the extension of their tools as they will be more familiar with farmer needs.
4. Partnering with farmers and rural professionals will assist extension professionals to achieve change at pace and scale especially when consistent messages are reinforced by other influencers. McCall (2013) a Paine (2010) noted that the

extension service cannot operate in isolation from private providers of one-on-one advice to farmers and identified partnerships as important. Extension professionals I interacted with expressed limited management support to spend time in relationship building. Relationships take time to build and extension professionals need a mandate and time to build these. Extension professionals that have long tenure will develop these relationships over time. New professionals will need some prioritization of key relationships to initially focus on so they still have enough time to interact with farmers.

5. Working one on one. While this is the domain area for private consultants, extension professionals need to be working one on one to better with at least one farm business to deeply understand how the business is run and be in a better position to offer practical ideas. Allowing professionals with longer tenure to spend some time working one on one could be a motivator for retention. McCall (2013) noted that, rapid change requires a one on one component. Organisations should allow their extension professionals to spend some amount of time working one on one especially where there is an opportunity to leverage the practice change more widely, for example, coaching other farmers and media articles on the farmers that have achieved change. Credibility is developed over time from credible, practical, useful answers that assist farmers in their day to day operations. Farmers interviewed mentioned that group facilitators who rarely provide on farm advice are slow to develop credibility. This suggests that group extension requires some one on one advisory experience which increases the credibility of the extension professionals.
6. Organisations creating opportunities for growth Motivate Good to Great performance through win-win discussions. Every year extension professionals are assessed through annual performance reviews and rarely do extension agents do the same assessment of their employer (the organization). Good to great is about

regular feedback opportunities. Additional motivating platforms include allowance to do some one on one, secondment to another department such as science/development or in extension in another country (could meet overseas experience needs of say young professionals while keeping them in the role), further study by completing a project leading to further qualifications such as an MSc among others.

7. Involving farmers in extension teams. This complements the rationale that farmers are more motivated to change when they hear and see examples from another farmer. This can be achieved by going beyond co-delivery (farmers working with extension professionals to deliver service to other farmers) at events to include co-development. Examples include the coach approach used in Tasmania Pasture Plus groups where farmers helped develop a program and delivered as a coach working with six other farmers willing to improve. Effective training in coaching is one key success. Similar experiences were noted by Sara Gregson a Nuffield scholar from the UK when she adapted a coaching model from Canada. Rob Bradley, a farmer from Tasmania who was a coach felt strongly that farmers will respond better if there is follow up and the follow up needs to be on farm. Rob noted that accountability provided by follow up while being more costly is also more effective.

Recommendations to funders of extension

1. Evaluation expectations are best agreed as part of the process of funding using a model such as Bennett's hierarchy.
2. Practice change happens over time. Short term projects (less than 3 years) compromise the potential scale of practice change.

Process of change

Ensuring a sustainable change in behaviour is a process, and involves a commitment of time, effort and emotion. The Stages of Change process concludes that change is a gradual progression of small steps toward a larger goal. For more read page 30.

Whether you want to increase farm profit, lose weight or accomplish another goal, there is no single solution that works for everyone. Multiple channels of message delivery get the best change results.

The "Stages of Change" model by researchers James Prochaska and Carlo DiClemente (1970s) is an effective way to understand how people go through a change in behaviour. The five stages are: Stage 1 Pre-contemplation, Stage 2 Contemplation, Stage 3 Preparation, Stage 4 Action, Stage 5 Maintenance, and Stage 6 Relapse. Understanding what stage a farmer is at allows the appropriate intervention from extension improving the success of the efforts to drive towards practice change.

Conclusion

There is convergent evidence that the most effective method of extension is using multiple methods and using local farmer change success stories as farmers learn best from other farmers. Extension professionals will be more effective at influencing change by initially understanding needs, identifying where a farmer is on the change cycle and delivering service in a way that will result in practice change. The true artistry of change management lies in a systems approach, aided by a range of tactics that extension agents may employ to create safety and enable change.

Why I applied to be a scholar

It has been my dream to be a Nuffield Scholar from 2005 when I realized many of my role models had Nuffield as a common thread. The topic was motivation by a desire to help answer the question why some farmers don't change practice in spite of practical solutions being delivered to their business. This project has been an opportunity to reflect on my own extension, continually question my activities and search for continuous improvement approaches from others.

The Nuffield journey

Receiving the email that I had been shortlisted for the Nuffield Scholarship was an achievement. Being granted a final interview was a blessing and receiving the phone call that I had been selected was heart stopping. The journey of the last 12 months has been an out of world experience. Being a Nuffield scholar attracts enormous respect both locally and internationally, opening doors that I never could have opened on my own.

Being awarded a Nuffield Scholarship is life changing. As I embarked on my journey around the globe I had no idea as to the scale or depth of the amazing networks or enduring friendships that have resulted. As an individual my self-confidence lifted and my ability to critically reflect was enhanced.

Acknowledgements

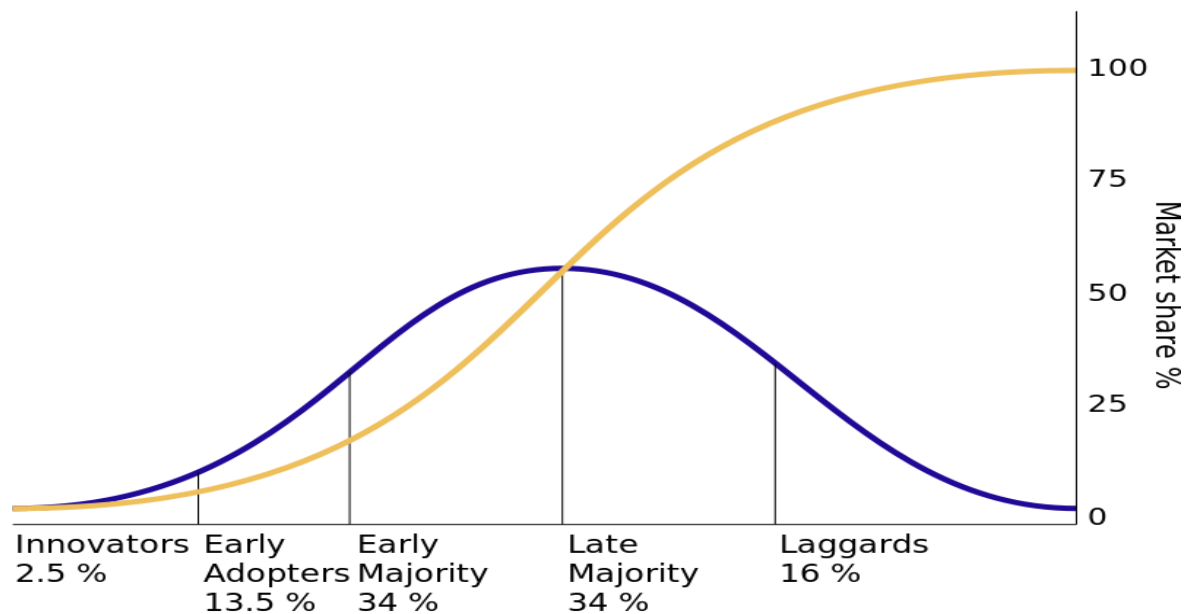
I thank the New Zealand Nuffield Farming Scholarship Trust for their wisdom in selecting me. Thank the sponsors who make it possible to undertake the travel without having to break the bank or starving the family. I had been told that Nuffield changes lives and mine was no exception. Special thanks to DairyNZ for supporting the Nuffield personal development opportunity in particular Craig McBeth, David McCall, Mark Paine and Tim Mackle.

To my 9 brothers that I travelled with see you soon and thanks to Nuffield Australia for organising the Global Focus Program. Thank you to Nuffield Canada for the time at the Contemporary Scholars Conference in Ontario. To the network of Nuffield Scholars and home hosts around the globe, I thank you humbly for accepting me into your homes and treating me like family. To all my project hosts the generosity of your time is appreciated. I acknowledge the unwavering support of family, friends, neighbours and staff for your kind words plus encouragement over the 5 months of Nuffielding. To my family – Whitney, Rufaro and Rosa, you travelled this journey with me and kept me going – thank You.

I thank all my reviewers for their guidance in writing this project.

Appendices

Figure 1. The Innovation adoption lifecycle (Rogers 1962)



With successive groups of consumers adopting the new technology (shown in blue), its market share (yellow) will eventually reach the saturation level.

Stages of Change Model

Stage 1 Precontemplation.

Farmers are not considering a change. Most are in denial as they believe that their behaviour is not a problem. Some are resigned to the current state, believe that they have no control over their behaviour, do not understand that their behaviour is damaging or are under-informed about the consequences of their actions.

Extension can ask questions such as have you ever tried to change this behaviour in the past? How do you recognize that you have a problem? What would have to happen for you to consider your behaviour a problem?

Stage 2 Contemplation

Farmers are aware of the potential benefits of making a change, but the costs are a barrier. This conflict creates a strong sense of ambivalence about changing and this can last months or years.

Many don't make it past the contemplation phase. During this stage, a farmer may view change as a process of giving something up rather than a means of gaining benefits.

Questions that extension could ask include, why do you want to change? Is there anything preventing you from changing? What are some things that could help you make this change?

Stage 3 Preparation

Farmers begin making small changes as a step approach to larger change. For example, if increasing pasture eaten is the goal, a farmer might start break fencing.

Extension professionals can encourage the farmer to gather information about ways to change such as encouragement to visit a farmer who has gone through similar stages, get someone to milk while they measure pasture growth, find outside resources such as support groups, or friends who can offer advice and encouragement.

Stage 4 Action

Farmers begin taking direct action in order to accomplish their goals.

For example, farmer has a plan to increase pasture eaten and immediately starts break fencing, measuring pasture growth, plans a regrassing program targeting poor paddocks, grazes ryegrass close to 3 leaf stage, and improves soil fertility. These

definitive steps are vital to success, but these efforts are often abandoned because the previous steps have been overlooked.

Extension professionals can congratulate these farmers as reinforcement and support them to maintain positive steps toward change.

Stage 5 Maintenance

Involves avoiding former behaviour and keeping up new behaviour. During this stage, farmers become more assured that they will be able to continue their change.

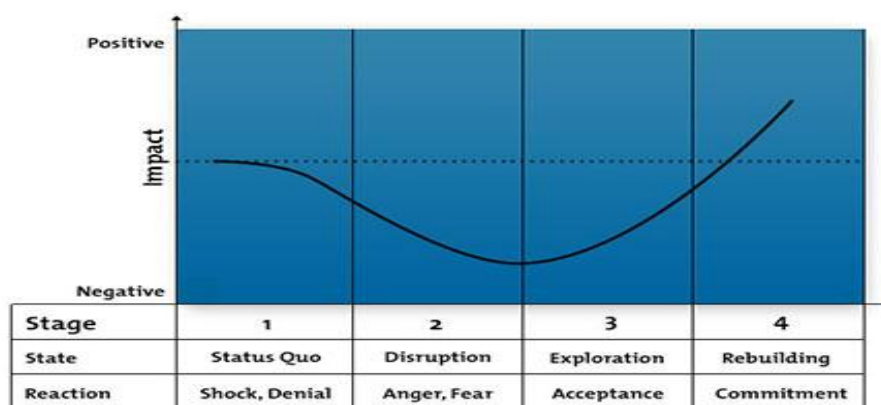
Extension can assist farmers maintain new behaviour by helping them to avoid temptation, compliment them and encourage them to reward themselves.

Stage 6 Relapse

In any behaviour change, relapses will occur. Extension can assist farmers by asking the questions, why it happened. What triggered the relapse? What can be done to avoid this in the future?

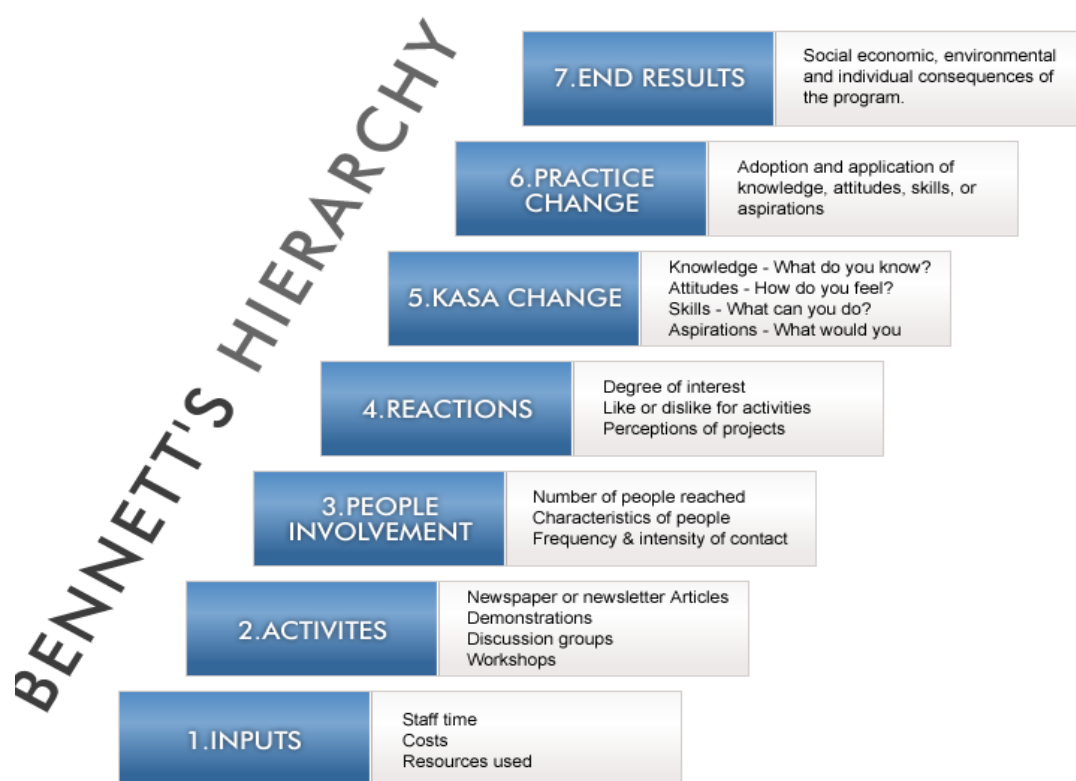
The best solution is to encourage the farmer to start again with the preparation, action, or maintenance stages of behaviour change. Reassess resources, techniques, reaffirm motivation, plan of action, and commitment to goals.

Figure 2 – The Change Curve



The extension aim is to make the curve shallower and narrower by reducing negative thoughts and accelerating change both achievable through role modelling.

Figure 3. Bennett's Hierarchy



After Bennett (1975)

Table 1. Farmer engagement in DairyNZ discussion groups

Year end 31 May	2010	2011	2012	2013
Number of groups	211	286	288	326
Number of farms	3946	5150	4602	5802
Percentage of all farms	34	44	40	50

Figure 4. How likely are you to make further changes to your farming operation in the future as a result of hosting a group?

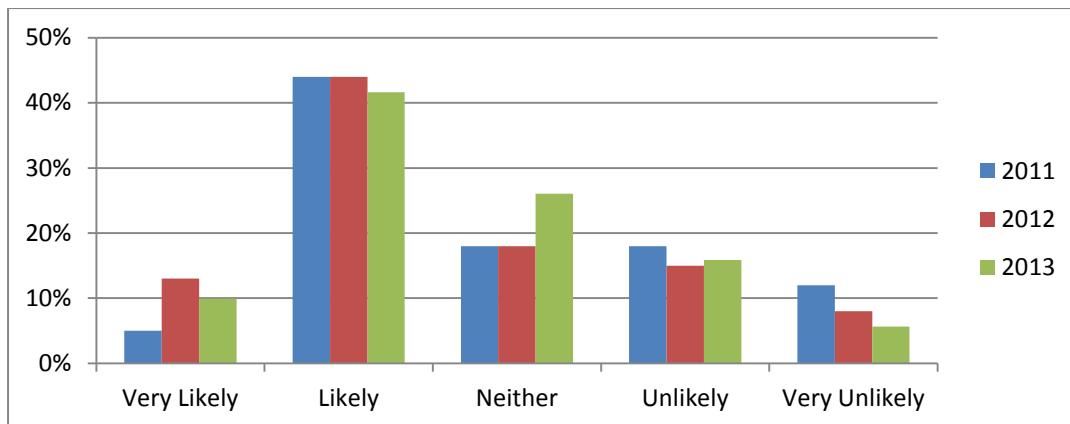


Figure 5 Impact to the farm business from changes implemented

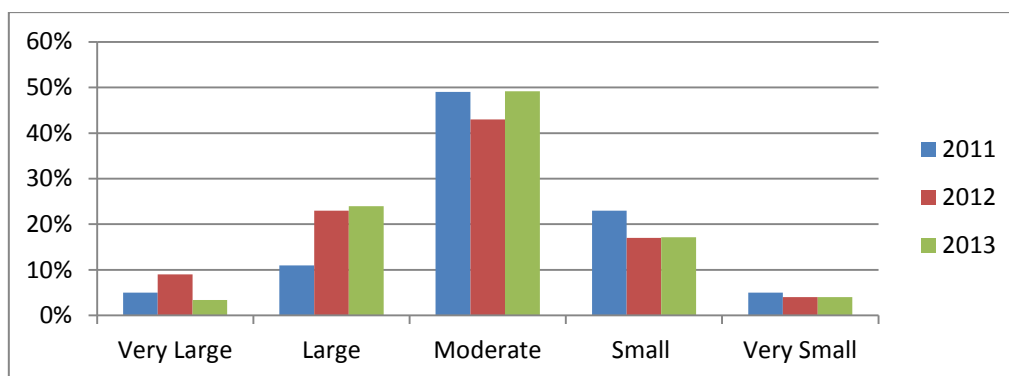
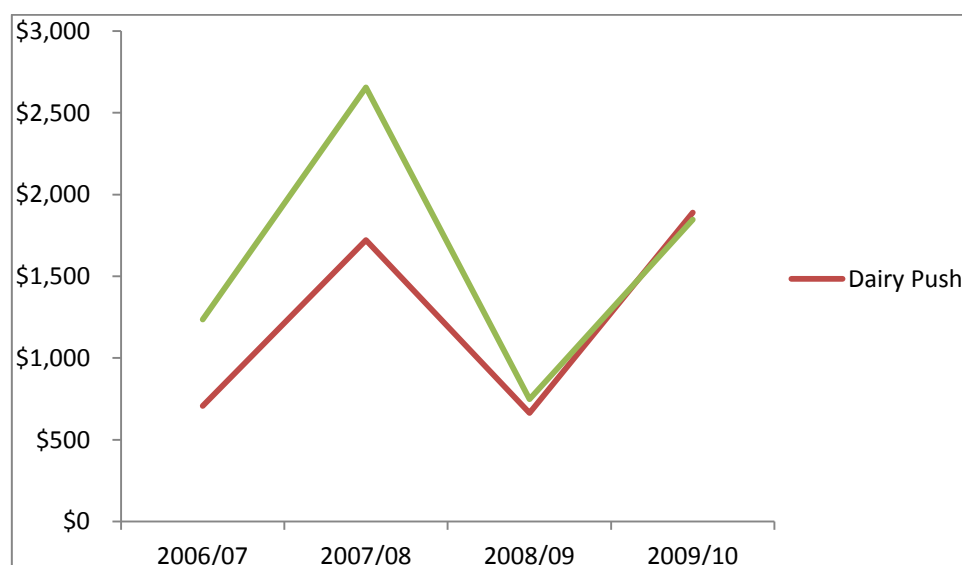


Figure 6 Change in operating profit per hectare on DairyPush farms over four years relative to Waikato benchmark farms



Self-efficacy by Bandura

According to Bandura, there are four major sources of self-efficacy.

1. Mastery Experiences

"The most effective way of developing a strong sense of efficacy is through mastery experiences," Bandura explained. Performing a task successfully strengthens our sense of self-efficacy. However, failing to adequately deal with a task or challenge can undermine and weaken self-efficacy.

2. Social Role modelling

Witnessing other people successfully completing a task is another important source of self-efficacy. According to Bandura, "Seeing people similar to oneself succeed by sustained effort raises observers' beliefs that they too possess the capabilities to master comparable activities and to succeed."

3. Social Persuasion

People could be persuaded to believe that they have the skills and capabilities to succeed. Consider a time when someone said something positive and encouraging that helped you achieve a goal. Getting verbal encouragement from others helps people overcome self-doubt and instead focus on giving their best effort to the task at hand.

4. Psychological Responses

Our own responses and emotional reactions to situations also play an important role in self-efficacy. Moods, emotional states, physical reactions, and stress levels can all impact how a person feels about their personal abilities in a particular situation. A person who becomes extremely nervous before speaking in public may develop a weak sense of self-efficacy in these situations and learning how to minimize stress

and elevate mood when facing difficult or challenging tasks, people can improve their sense of self-efficacy.

Statements on how extension can build trust with farmers (various sources)

1. Being useful – interacting with people in a way useful to them – information, brokering, referrals
2. Personal relationships
3. Understand the person – adapt the technology = good extension.
4. Overwhelming feedback from community
5. Continuity of contact
6. First step in community engagement is to understand not to tell. Cup of tea conversations on goals, what do you want to achieve.
7. Small successful transactions – return phone calls, deliver what you promise.
8. People want the personal connection – human moment. There is engagement fatigue out there – groups, workshops un-engaging for people.
9. Adviser trust and credibility are earned slowly but can be lost quickly by actions such as support of an innovation clearly unsuited to local conditions or conflicts with goals of the farmer

Denmark Farmer Field School - Henrik Lasse Matin

The Farmer Field School is a form of adult education, which evolved from the concept that farmers learn optimally from field observation and experimentation (FAO, 2004).

- Facilitator calls farmer and farmer identifies 2 areas they want to change.

Facilitator sends farm information to group week before the event.

- Verbal contract on what success would look like for the farmer and facilitator
- Agenda for the farm day is sent out 1 week before meeting
- Start at 9am with cup of tea

- First question – progress update from last host farmer
- Introduce farm – goals of the farm, resources, performance and others
- Success story of the farm on any topic. Sharing with group.
- 2 change focus areas briefly outlined
- Farm visit for 45 minutes
- Table discussion on the focus areas ask questions to get knowledge about farm and help with feedback
- Farmers in the group to ask a question to the host
- 1 minute of silence to propose recommendation

Group propose recommendations (host can't answer)

- Right to respond (host) and pick best option
- Host then identifies
 - Who
 - When
 - What progress can we check on the next time

Send copy of actions to their partners advisor/vet. The next farm day (2 visits to same farm in a year) for that farm has a focus to follow up on progress from last visits actions.

The farmer field school (FFS) concept was developed and used in developing countries. A Danish research project written by Vaarst et al. in 2007 focusing on explicit non-antibiotic strategies involved 22 farmers out of 46 supplying one company who actively expressed an interest in phasing out antibiotics from their herds through promotion of animal health. One way of reaching this goal was to form participatory focused farmer groups in an FFS approach, which was adapted to Danish conditions and named “stable schools.” Four stable schools were established and went through a 1-yr cycle with 2 visits at each of the 5 or 6 farms connected to each group. A facilitator was connected to each group whose role was to plan the group meeting together with the host farmer, direct the meeting, and write the

minutes to send to the group members after the meeting. Through group focus interviews and individual semi structured qualitative interviews of all participants, the approach of the farmers' goal-directed work toward a common goal was judged to be very valuable and fruitful and based on a common learning process. Complex farming situations were the focus of all groups and in this context, problems were identified and solutions proposed based on each farmer's individual goals.

All farmers reported trying things they would not have tried if other farmers had not convinced them.

Partnerships

Successful practice change begins and ends with a successful partnership. Successful partnerships exceed the sum of individual efforts combined and give greater access to resources than might be available when dealing with separate organisations and farmers. A credible and trustworthy partner isn't looking for a simple one off transaction but will work over the long-term for the benefit of both parties to ensure their common goals and objectives are met. There is no single social network in a community that serves all purposes. By partnering, one is able to increase their own credibility and image. Once a partnership is secured it needs to be nurtured and maintained. The aim should be to create an "ecosystem" of partners. Partnering offers extension the power to win with a world-class team.

Follow-up

Good follow up allows extension to (in sales language) double the closing ratio. When a person makes contact with a farmer a relationship has been built, and follow up is how it is nurtured. Staying at the forefront of a farmers mind requires persistence and should not be confused with being bothersome. This is why it's important to get agreement on some next step each time there is contact. Follow up

therefore is not a one off interaction. Follow up conversations are best handled by the person who started the relationship. This means notes must be kept on each interaction somewhere centralized.

The Power of Positive deviance

Pascale *et al* in 2010 wrote about how positive deviance influences practice change. The approach originates from Tufts University nutrition professor Marian Zeitlin in the 1980s and has three steps. First, engage the people needing change in the process; they must take part in discovering answers to their problems to adopt changes. Second, identify “positive deviants”—people who seem to have succeeded compared with others, despite having the same resources. Finally, work with communities to pinpoint what the positive deviants do differently, and figure out how the whole community can adopt these successful practices. Leverage positive deviants, the individuals in a group who find unique ways to look at, and overcome, seemingly insoluble difficulties. By seeing solutions where others don't, positive deviants spread and sustain needed change

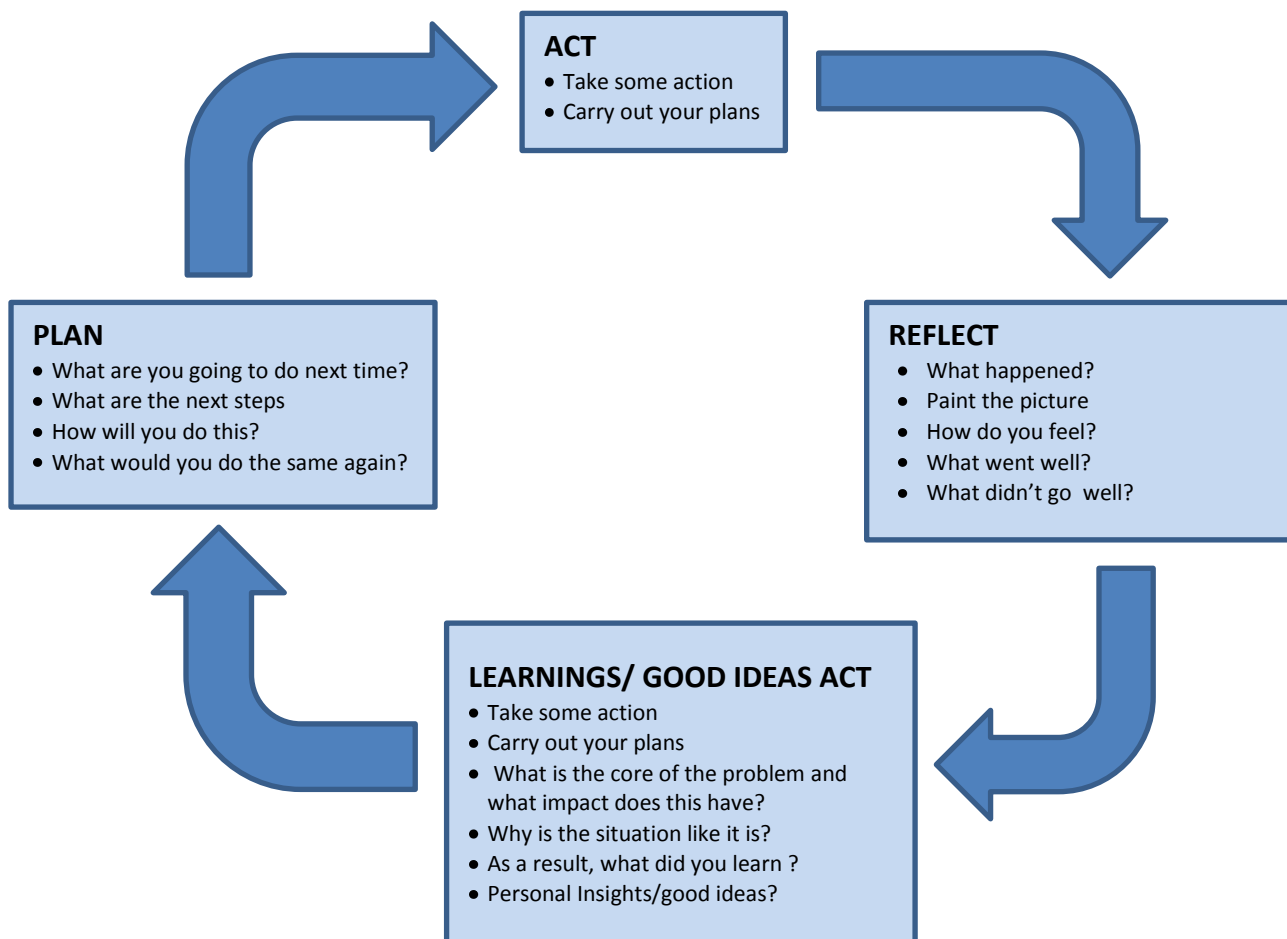
Positive Deviance is a bottom-up approach observed in effective farmer groups where a farmer shares a challenge and a farmer who has solved the same problem shares what they did.

Action learning – Maria Nolan

Action-Learning is the **continuous** process of consciously learning from one's own experience/action and that of others in order to improve future practice (both personal and professional). It helps us to learn from our experience to avoid repeating mistakes.

Action Learning ‘A Way To Create Change In Your Life’

Figure 7. I SeeChange consultants Action learning cycle



Adapted from Revans, R.W., Action Learning, New Techniques for Management, Blond & Briggs, 1980 by I See Change consultants in Brisbane.

How Action Learning helped with software roll out at Lockyer Valley Regional Council

Lockyer Valley Regional Council staff who have used the model facilitated by ISeeChange consultants commented that their process : Encouraged interdepartmental communications, Demonstrated the importance of team work, It allowed us to have interdepartmental communication which has improved relationships, It allowed us the opportunity to share our feelings, We were given tools for problem solving and facilitating change, It helped to break down silos and help us to understand what goes on in other departments, It helped me to see the big picture.

This concept is similar to the plan, do, review model but the richness of questions at each stage can be used in follow up discussions with farmers to identify the root cause of why practices have not been undertaken and what needs to happen for change to embed.

Quotes and statements on practice change

"People with high assurance in their capabilities approach difficult tasks as challenges to be mastered rather than as threats to be avoided." **Professor Albert Bandura**

"You will never get change unless you demonstrate that it's in the person's best self-interest to change." **Professor Albert Bandura**

"One hour with a good teacher is worth more than 1 000 hours of study." **Neil**

Webster Dairy Australia

The opportunity and challenge is to help younger people with university education to listen to farmers – **Nigel McGuckian** RMCG Consultants

Etienne Regnaud (Director of Chamber of Agriculture France)

- Change management is 1st about changing oneself
- You have to live the change yourself to go through a change
- To be able to drive change advisers need to understand deeply and have to initially change the way they advise and keep doing the things that get results (change)
- You don't have to leave your technical competence but you need to go beyond technical competence
- Process of change is an interaction, understanding deeply from advisor
- Make farmers rely on advisors and not to be dependent on them.
- If you don't go to one on one advising getting change is nearly impossible.

Basil Doonan (Farm business consultant Tasmania)

Improving skills is a key to achieving practice change. There is a link between skills and profit. Some of his steps are to

- Encourage farmers to enroll in a pasture group if they don't want Basil will do it with them monthly – post graze and pregraze by leaf stage
- Take farmer to paddock – how do you determine rotation
I think it can grow 3 times more grass if you... will you do that?
- Change is best achieved when you have a conversation on common ground, are able to turn people on and build trust based relationships
- Within a week of interaction with some of his clients, Basil tells them that they are the biggest limitation to the business
- Small groups are more effective than one on one especially when you don't have core capability – supported learning.
- If you take out the top 10% most linear relationships become scatter diagrams so to get the true result take out the top 10%.

Dreyfus model and its application to skill training - Warwick Waters

Pair up trainers/mentors and apprentices effectively. A common mistake is that the better you are at a skill the better a trainer you will be. Actually, experts can be the worst possible trainers as they may lack the language (not to mention the patience) to deal with novices. It's usually better to pair up people who are not more than two levels apart. That way, the trainer/mentor has significantly more experience than the apprentice, but can also reflect back to the time they were an apprentice themselves. Dreyfus stresses that in order to reach the expert stage, we need to take chances (as opposed to following routines). We do not become experts without making, and learning from, serious mistakes.

This has significance on how we train people in extension. The normal practice of using experts to train novices may require a rethink and can be managed by having some mentoring from less experienced members of teams.

Practice change checklist

Recruit for tenure by selecting professionals that want to be in extension for the medium to long term. Offer professionals training in technical skills such as farm systems. Also train to enhance interpersonal awareness and relationship management skills.

Principle	Suggested process
Recruit farmer panel ⁺	<input type="checkbox"/> Co- develop program and consider co-delivery
Identify farmer needs (goals)	<input type="checkbox"/> Farmer goals <input type="checkbox"/> Needs assessment through a participatory process <input type="checkbox"/> Gap analysis (Honest discussions)
Define success	<input type="checkbox"/> Clarify expectations from professional and farmer(s) <input type="checkbox"/> Service contract
Identify position on the change cycle	<input type="checkbox"/>
Identify barriers to change	<input type="checkbox"/> What is limiting the farmer(s)
Plan Evaluation process	<input type="checkbox"/> Involve farmer panel
Influence thinking (beliefs) Observation of models	<input type="checkbox"/> Establish peer groups with similar needs <input type="checkbox"/> Value proposition to change (consider gap analysis results) <input type="checkbox"/> Delivery of events for peer group <input type="checkbox"/> Provide farmer role modelling * such as field days
Increase self-efficacy Behaviour change	<input type="checkbox"/> Peer group pressure and support (events & recommendation) <input type="checkbox"/> Role modelling* <input type="checkbox"/> One on one - break actions into small change steps <input type="checkbox"/> Involve the gatekeepers <input type="checkbox"/> Follow up process with gatekeepers and or farmer
Encourage progress to next stage of change cycle and repeat process	<input type="checkbox"/> One on one <input type="checkbox"/> Peer group pressure/support <input type="checkbox"/> Role modeling <input type="checkbox"/> Follow up process with gatekeepers and or farmer
Evaluation	<input type="checkbox"/>

+ farmer panel could be drawn from influential, respected farmers (it is important for the farmers to be interested in assisting the planning of the program and its delivery).

*farmers similar to the farmers extension want to influence. Select farmers who had the same challenges and have recently overcome it. Enable farmers to see several role models for vicarious association

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