

Contesting targets as a measurement of success in agricultural extension: a case study of the Grain & Graze Change-on-farm strategy

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Abstract. Grain & Graze was a mixed-farming systems program conducted across nine regions of Australia over 2003–08. It had a goal of ensuring adoption of recommended practices on 6800 farms within the 5-year life of the program. This extension-based success target was further reflected in adoption targets set in contracts for each of the nine regions, and embedded into the program's extension initiative, the Change-on-farm strategy. By 2008, the program had achieved adoption on 3200 farms. While less than half the target, this was considered by many a remarkable achievement, raising questions about the efficacy of adoption targets as a measurement of success. In a program based on devolution, regional delivery and local empowerment, the targets were contested between participants on other grounds. This paper explores how the targets were set, what Change-on-farm supported, what it achieved and how its success related to adoption targets. Using the Grain & Graze program as a case study, the paper concludes that the notion of targets as a motivator of success rather than as a measure of success is pertinent in complex systems-based research and development. The authors do not advocate avoiding targets, but suggest that both targets and the evaluation process by which success is measured be mutually negotiated in the true spirit of participatory process.

Introduction

Mixed-farming systems are a major form of agriculture across the sheep-cereal zone of Australia (Ewing and Flugge 2004). They present particular challenges to both research (Schiere *et al.* 2004; Robertson *et al.* 2009) and extension (van Keulen and Schiere 2004), particularly in respect to dealing with complexity (Holling 2001) and complex decision making (Holling 2001; Snowden 2002). The Grain & Graze program (Price and Hacker 2009) attempted to address mixed-farming challenges in this zone between 2003 and 2008. These challenges included increasing the profitability of both the cropping and livestock components of mixed farms while reducing their on-farm and off-farm impacts on natural resources (Grain and Graze 2003). The national program was supported by the red meat, grain and wool industries and the Australian government, and invested industry and public funds into a range of research, development and extension (RD&E) activities across nine regions of the sheep-cereal zone. These activities were carried out at both the local (regional) and national scales.

For all its emphasis on attempting to understand mixed-farming systems from a holistic, triple bottom line perspective, the objectives of Grain & Graze reflected a strong desire by the program's management to achieve large-scale adoption of

innovative farming systems that would be both profitable and environmentally sound. This desire was translated into an adoption target of new farming systems practices being introduced onto 6800 farms during the 5-year duration of the program. The success of the program, therefore, hinged on achieving adoption on at least one in every five mixed farms across Australia within the short life of the program, paying scant regard to the likelihood of adoption lags (Rogers 1962; van den Ban and Hawkins 1996), traditionally low levels of adoption experienced in Australian agriculture (O'Campbell 1980; Gorrard 1993; Guerin and Guerin 1994) and rational reasons for non-adoption of research results (Marsh and Pannell 2000; Vanclay 2004; Pannell *et al.* 2006). Such a target therefore posed an enormous extension challenge, which is dealt with in this paper, as well as a social and institutional challenge, addressed in Rickards and Price (2009) and Price (2008).

With this challenge posed, and an achievement of 3200 farms adopting new practices by the conclusion of the program by 2008 (i.e. 50% of the target), the question arises about what is considered a successful level of achievement in rural extension, to whom and why? While adoption on 3200 farms represents half the aspiration, it may nonetheless be considered a high level of adoption given the complex systems involved and previous evaluations of agricultural extension (Alston *et al.*

2000). This paper explores the Grain & Graze program, and in particular its extension approach (the Change-on-farm strategy), as a case study of agricultural extension where the level and nature of success was contested among its community of RD&E participants. In the spirit of a case study, the exploration aims to provide useful insights into program and extension management and lessons for similar initiatives in the future.

Case study approach for reflecting on extension in Grain & Graze

The descriptions, assessments and conclusions in this paper are drawn from a combination of the experiences of the authors in Grain & Graze together with the results of an independent evaluation of the Grain & Graze program (Read and Petersen 2008). Each author has a deep understanding of extension theory and practice, and during Grain & Graze fulfilled the roles of National Operations Coordinator (Price), Regional Grain & Graze Coordinator (Nicholson) and National Social Research Project Leader (McGuckian). Each author was involved in evaluation activities at either the national or regional scale, and each was required to provide monitoring and evaluation analyses in their final project reports. In the case of Nicholson, interviews were conducted with other regional coordinators. McGuckian also interviewed farmers, and many of these interviews were recorded as oral and published case studies (McGuckian 2007).

Given the nature of the authorship and the privileged positions each held in the program, readers are asked to be aware of this conflict of interest and the potential subjectivity of the material that follows. As long ago as the early 1930s, sociologists have claimed that all case studies possess this element of subjectivity (Bain 1934), even where independently authored (i.e. when the observers are not also participants) (Macionis 2008), for all case study writers bring with them means of interpretation based on their past experience and their values and beliefs (Campbell 1975). And while conventional wisdom suggests that by detailing a single example of a class of phenomena, a case study cannot provide reliable information about the broader class (Abercrombie *et al.* 1984), some argue that this fails to understand how people learn, with everyone having the capacity to interpret a case study's meaning in the context of their own experience (Flyvbjerg 2006). As a sociologist who has undertaken anthropological field work employing reflexive methodology (Macbeth 2001), the main author has endeavoured to ensure that this case study is as unimpeded by subjective interpretation as is possible.

Although the case study draws on personal observation and interpretation of that observation, it also draws upon qualitative and quantitative data compiled by Read and Petersen (2008) in an evaluation of the overall Grain & Graze program upon its completion. This evaluation involved three stages. Stage 1 included five separate surveys tailored to each of five stakeholder groups: regional management team members ($n = 90$), farmers ($n = 200$), national management team members ($n = 4$), national project leaders ($n = 5$) and program management committee members ($n = 12$). Each survey, undertaken between December 2007 and April 2008,

included a subset of questions based around the development, implementation and achievements of the Change-on-farm strategy. Stage 2 involved analysis of these survey results together with survey data obtained on a 6-monthly basis between December 2005 and July 2008. These data were generated as part of a much wider survey of Australian farmers nationally ($n = \sim 2000$) referred to as AgScan, carried out on an ongoing basis by the consulting company Solutions Marketing. Many of the farmers interviewed in AgScan surveys were not associated with Grain & Graze directly and may or may not have heard of the program or participated in any of its activities. The Grain & Graze questions inserted into the AgScan surveys aimed to solicit data on awareness, participation and adoption levels in respect to Grain & Graze activities and recommended practices. Stage 3 involved reporting.

Change-on-farm strategy of Grain & Graze

Establishing adoption targets: what were we chasing?

The extension approach of Grain & Graze was referred to as the Change-on-farm strategy. Before it is described, however, it is useful to know that the strategy was developed over the first 12 months of Grain & Graze, rather than before its commencement. The program's business plan (Grain and Graze 2003) set an adoption target of 6800 farm businesses adopting new mixed-farming systems practices consistent with achieving a program goal of increasing farm profitability by 10%, maintaining or improving catchment health, and enhancing pride and social capital among participating farmers. The target of 6800 was based around the known investment level of the program consortium (around A\$15 million over 5 years) and the desire to achieve a 6:1 return on this investment. From this target, a cascading set of targets was developed in the context of an adoption model that formed the basis of the Change-on-farm strategy.

Establishing targets for extension is not novel (Kaine *et al.* 2007) and is certainly consistent with modern managerialism (Enteman 1993). In the Grain & Graze context, funded as it was by four of Australia's rural research and development (R&D) statutory authorities and companies, the expectation to quantifiably account for their activities was considered core business (Tasman 2008). Target setting in agricultural extension can take several forms. Targets can be set around the number of farmers targeted to adopt new practices. They can also be set around the physical size or extent of an issue being addressed i.e. hectares targeted or level of degradation reduced. They can also be set against achieving a certain return on investment, which might be attained by achieving either or both of the other targets (Buchan *et al.* 2007). The emphasis on achieving adoption targets in Grain & Graze based around farmer numbers arose out of participants' experience in the Sustainable Graze Systems (SGS) program (Mason *et al.* 2003). This program had been supported by two of the Grain & Graze core funding partners, Meat & Livestock Australia and Land & Water Australia and had just been completed before the establishment of Grain & Graze.

The SGS claimed to have achieved remarkable adoption levels ($\sim 10\,000$ graziers adopting new practices), and had undergone an evaluation process (Allan *et al.* 2003), which

involved a high level of quantitative reporting. The euphoric sense of satisfaction that comes from completing what is perceived as a successful program (Hopfl 1994; Price 2003), together with substantial engagement of people involved in SGS in designing Grain & Graze, inevitably led to a desire to repeat that success. This meant an emphasis on quantitative targets embedded into the business plan and subsequently into the extension strategy (Grain and Graze 2004a), monitoring and evaluation plan (Grain and Graze 2004b), and project contracts.

The program's business plan had specified that the adoption target would occur on 6800 mixed farms; however, this target was originally intended to be achieved by 2015, allowing for up to 10 years of adoption lag and accrual of benefits to attain the 6:1 return on investment. This element of the plan was overturned, and the program partners sought to have the target achieved during the life of the program (i.e. by June 2008) so as to give the monitoring and evaluation processes a definitive boundary within the program's budgetary timeframe.

Change-on-farm strategy: what was our framework?

With the main target and timeframe for the program set, representatives of the program partners commenced preparation of an extension strategy based around further targets tied to the stages of adoption outlined in the SGS adoption model (Fig. 1) (Nicholson *et al.* 2003) and the body of extension theory that model was based upon (particularly Rogers 1973; Vanclay and Lawrence 1994). As the primary emphasis on adoption was about transformative technologies and practices (Hill 2006), the strategy came to be called the Change-on-farm strategy. The three key elements of the strategy dealing with awareness and motivation, participation and adoption are briefly outlined:

(1) Motivation stage (beyond awareness): An 'awareness' target for the program was set for 24 000 farmers to be aware of Grain & Graze activities and become motivated enough to seek more information with the anticipation that many would then participate. Awareness was seen as a continuum ranging from passive to active awareness of the program. For

example, a general media release may have increased a person's awareness of the Grain & Graze brand or even of its findings without requiring further action on behalf of the reader (passive), compared with material and, personal communications aimed at engaging people to become involved in specific activities (active). Examples of what Grain & Graze did in this stage, and the next two, follow further below. The 24 000 target reflected 60% of total potential audience, a ratio suggested as feasible given the past experience of the program partners in SGS rather than on the basis of the wider marketing literature in respect to agriculture. It was also suggested by management participants as the minimum level of awareness required in order to attain the participation target and subsequently the adoption target.

(2) The exploration and trialling stage (beyond motivation): a 'participation' target was set for 15 000 farmers to become engaged in Grain & Graze activities. Like 'awareness', participation was also viewed as a continuum ranging from passive to active participation in the program. The aspiration was that 15 000 participants would be actively engaged in the learning process and seeking opportunities to support their learning needs through participating in training, attending field activities, sharing experiences through farmer group networks, trialling ideas on-farm and generally raising their level of knowledge and skills to enhance decision making and change management on-farm. Set at around 60% of the awareness target, again the target was based on participation levels claimed in the SGS and the minimum level thought required to achieve the adoption target.

(3) Farm practice change (adoption and beyond): as previously discussed, the adoption target for the program was 6800 farmers having adopted desired change-on-farm. This was seen as a continuum ranging from targeted component change through to broad-based systems change. The practices to be adopted were not initially defined, but during the fourth year of the program, regions were asked to identify such practices so that these could be used as the basis for measuring successful adoption. These practices are described in Table 1.

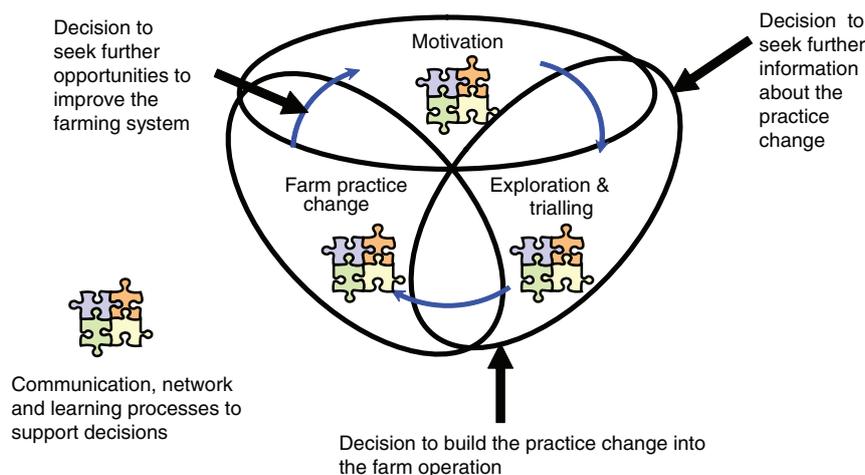


Fig. 1. Grain & Graze practice change model.

Table 1. Description of Grain & Graze key farm practices

Key farm practice	Description
Assessment of food on offer	Visual measurement of fodder volume within paddocks. It is generally measured in kg of dry matter per hectare and can be a qualitative assessment but includes more than just driving by and looking at the pasture. They have to get out and walk through the paddock
Changing enterprise mix to manage drought	Changing the balance between cropping and grazing, changing herd structure – breeders v. store cattle
Condition scoring	Rating (generally from 1 to 5) of the amount of muscle and fat covering the animal. It can be qualitative, but should be a quantitative rating
Consideration of pasture persistence when selecting pasture species	Choosing species that have good survival on your soil type and with your climatic conditions, and using legumes for long-term fertility
Containment areas for grazing sheep	A form of feedlotting for the purpose of protecting the soil from erosion during dry conditions. Traditional feedlotting is for the purpose of improving sheep production rather than soil protection, and requires a licence
Deferred grazing	Excluding sheep from some pasture areas to optimise pasture growth (includes rotational grazing)
Feedlots	Containing livestock for the purpose of maintaining sheep when feed is low and/or to obtain optimal condition of cattle for various markets
Fodder budgeting principles	Determining how much dry matter is available for grazing using a ruler and calculations, determining the best stocking rate for the available dry matter, understanding the stage of crop developing and when to remove livestock from grazing it
Grazing cereals	The sowing of a cereal crop and then grazing it with livestock in winter before harvesting it, as opposed to sowing a crop and just harvesting it for grain
Grazing cropping land	Sacrificially grazing a failed crop, grazing forage sorghum, grazing stubble and burgundy bean
Improved management of grazing wheats	Use of feed supplements such as sodium, magnesium, salt and casmag mix, or monitoring when livestock commence and finish grazing to ensure maximum grain yield
Improved measurement of feed in the paddock	Through pasture walks with an agronomist, feed testing, recording the number of days the paddock is grazed and physical measurement of available pasture
Integrated pest management practices	Practices may include monitoring for pests and predators, using monitoring results to determine whether spraying is needed, and seed treatment and baiting before crop establishment
Management techniques aimed at improving biodiversity outcomes	This includes soil, pasture and vegetation biodiversity. Management techniques may include rotational grazing, groundcover maintenance, stubble retention, revegetation, fencing of vegetation
Pasture cropping	Sowing cereal crops directly into perennial pastures to exploit the different seasonal growth patterns between the crop and the pasture
Sowing cereals into existing lucerne stands	Sowing wheat, barley, oats or triticale into existing lucerne stands
Sowing fodder shrubs	Including tagasaste, saltbush and <i>Rhagodia</i> spp.
Sowing of pastures and forage crops	Sowing triticale, barley, lucerne and other crops for grazing purposes. Other crops may be oats, vetch, field peas. They may get some hay or grain from the crops, but their primary purpose is for grazing
Subtropical perennial grasses	Includes Rhodes grass, Gatton panic, Green panic, Signal grass, <i>Setaria</i> , <i>Kikuyu</i> , Bambatsi panic, Bermuda couch

These three targets were further broken down in the Change-on-farm strategy into annual targets (Table 2) and targets assigned to each region participating in the program (Table 3). This was to enable a highly quantifiable monitoring and evaluation strategy to be constructed, with annual monitoring of targets providing the level and frequency of feedback needed to ensure strategies could be adapted in order to achieve to main adoption target.

Table 2. Summary of awareness, participation, adoption targets (as a percentage of all mixed farmers)

	Awareness of Grain & Graze (%)	Participation in any Grain & Graze activities (%)	Adoption of Grain & Grain practices (%)
Year 1	10	5	0
Year 2	20	10	2
Year 3	40	25	5
Year 4	50	30	10
Year 5	60	38	17

Once the targets were set, the strategy needed to specify the specific extension activities requiring investment. The SGS framework provided some direction; however, further guidance was needed from elsewhere to instil a sense of confidence that the activities would not be hit-or-miss. As it happened, the

Table 3. Summary of regional targets for the program over 5 years

Region	Participation	Adoption
Northern Agricultural	1000	450
Avon	1000	450
Eyre Peninsula	500	250
Mallee	500	225
Corangamite Glenelg Hopkins	1200	550
Murrumbidgee	1500	700
Central-West Lachlan	2000	900
Border Rivers	1500	700
Maranoa/Balonne	800	375
Other regions	5000	2200
Total	15 000	6800

commencement of Grain & Graze coincided with a productive period for another cross-industry program, the Cooperative Venture on Capacity Building (CVCB), in which all core funding partners of Grain & Graze co-invested. The CVCB program had recently released a range of papers about extension methodology, including a synthesising report on best practice in extension models (Coutts and Roberts 2003). Underpinning this work was the notion that effective extension requires a multitude of approaches put in place simultaneously, an idea that had been advocated extensively (e.g. Coutts 1997; Marsh 1998; Stantiall and Paine 2002; Vanclay 2004), but had proved difficult to put into practice (Vanclay 1994). The approach to extension is particularly consistent with the social principles of agricultural extension outlined by Vanclay (2004), specifically Principle 2 (farmers are not all the same) and Principle 24 (the best method of extension is multiple methods), and in particular take into account the need to segment target audiences along the lines of farming contexts (Kaine and Lees 1994) and farming styles (Mesiti and Vanclay 2006; Vanclay *et al.* 2006).

A total of A\$1.9 million, or 13% of the total Grain & Graze budget, was invested in the Change-on-farm strategy. This did not include further contributions allocated by regional partners for implementation through the regional programs. Within the strategy were six key investment tactics:

- (1) Group facilitation and empowerment (adapted from the CVCB group facilitation/empowerment model);
- (2) Communication (adapted from the CVCB information access model);
- (3) Training (adapted from the CVCB programmed learning model);
- (4) Mentoring and exchange (adapted from the CVCB personalised consultant model);
- (5) Technology development (adapted from the CVCB technological development model); and
- (6) Coordination (this tactic was not a CVCB model, but rather dealt with coordination of all the tactics within a cohesive, accountable framework).

Fig. 2 shows how these tactics were thought to relate to the three stages of the SGS model. While there was a national budget directed towards the six specific tactics of the Change-on-farm strategy, a significant element of the strategy was having the awareness, participation and adoption targets set out as objectives embedded into each of the contracts executed between the national funding partners and the nine regional partners. This meant that the regions were required to allocate additional resources to complement national funds in extension activities consistent with the Change-on-farm strategy and its targets.

Extension activities: what did we do?

Grain & Graze extension activities were supported under the six models outlined previously. These are described briefly below, with the data sourced from the program evaluation (Read and Petersen 2008). The relationship between these models and the SGS practice change framework is shown in Fig. 2.

Group facilitation and empowerment: regional farmer-led committees were established in each of the nine regions

Target	Awareness 24 000	Engagement 15 000	Adoption 6800
Practice Change Model	Motivation	Exploring and trialling	Farm practice change
Tactics	1. Group facilitation/empowerment		
	2. Communication		
	3. Training		
	4. Mentoring and exchange		
	5. Technology development		
	6. Extension coordination		

Fig. 2. Summary of framework for the strategy (grey indicates relevance to the Sustainable Graze Systems model stage). Values in column headings refer to farmers.

covered by Grain & Graze. These committees were responsible for identifying local research and extension priorities and shaping and monitoring subsequent activities. Most of the Grain & Graze activities were undertaken with groups. Over 300 group events took place across the regions. Some of these are described in the subsequent extension models.

Communication: communication consultants were engaged to manage national media and product development and coordinate regional media and product development. Over 250 media releases were prepared, with the focus in the early years on engaging farmers and motivating their involvement in activities, and in the later years on describing research findings in terms of their comparative advantage, triple bottom line benefits and ease of incorporation into existing systems (in line with the findings of Vanclay 2004 and Pannell *et al.* 2006). Over 200 publications, toolkits and audio CDs were also produced, ranging from guidelines on dealing with specific aspects of farming systems through to guidance on thinking through complex decisions involving whole-farm, business and social dimensions.

Training: 165 training workshops involving over 1800 different farmers were conducted over the life of Grain & Graze, including broad-based courses on farming systems and managing biodiversity, through to specific skills-based courses including calculating feed-budgets and assessing livestock condition. In some cases, training courses were directed towards farm women, and in most cases families were invited to participate. A national biodiversity course held in Hobart, for example, specifically sought and made it easy for farm partners and children to participate. Involving farm families in the learning process is often considered crucial to success (Dunn 1991), particularly in the context of complex decision making (McGuckian 2008).

Mentoring and exchange: funds were made available for farm groups in any one Grain & Graze region to visit any other region. Wherever possible, farmers were used as the primary presenter at field days and other learning events, maximising farmer-to-farmer knowledge sharing

(Enshayan *et al.* 1992). Indeed, some farmers were paid to run training workshops in other regions. National farmer forums were convened annually to bring participating farmers together to share their experiences, good or bad, about Grain & Graze in their region. These events, which encouraged farmers to rub shoulders, were considered sacrosanct and immune from budget cuts.

Technology development: 278 research and demonstration trial sites were established across Australia, with most conducted on-farm and supporting participatory research principles (Chambers 1994; Rocheleau 1994; Selener 1997). A range of decision support systems were developed to aid whole-farm planning [e.g. Grain & Graze Whole-Farm Model (Millar *et al.* 2009)].

Coordination: a national extension coordinator was appointed in 2004 to oversee the implementation of the Change-on-farm strategy. The role of this position was not to undertake extension activities, but rather to ensure that regional extension teams were supported and connected. A regional network of coordinators operated and over time came to initiate joint extension products and events of relevance to more than a single region [e.g. Free Food for Thought roadshow (Nicholson 2008)].

Extension results: what did we achieve?

Data on the achievement of awareness, participation and adoption targets had been gathered through a combination of the independent AgScan surveys and reporting arrangements involving regional participants in the program. Specifically, awareness and adoption data were reported through the AgScan surveys while participation was reported through both AgScan and regional processes. Table 4 summarises the results.

Awareness

The original awareness target of 24 000 producers did not specify awareness among mixed producers, although this was implied as it had been based on a calculation of 60% of all mixed farmers (~39 000). While a total of 45 353 farmers became aware of the program, many of these were sugarcane growers and dairy farmers and others not involved in mixed farming who would watch, listen to or read generic farming media such as *Landline*, *The Rural Report*, or *The Land*. Within the nine participating Grain & Graze regions, a total of 18 271 mixed

Table 4. Summary of achievement against Grain & Graze (G&G) targets

Indicator	Target	Outcome (as reported by AgScan)	Outcome (as reported by regions)
Awareness (all farmers nationally)	24 000	45 353	Not collected
Awareness (mixed farmers in G&G regions only)	Not specified	18 271	Not collected
Participation	15 000	5259	14 510
Adoption (attributable to G&G)	6800	3158	Not collected
Total adoption of G&G recommended practices	Not specified	26 009	Not collected

farmers (the primary target audience) became aware of the program.

The AgScan surveys suggested that most of those aware of the Grain & Graze brand within Grain & Graze regions were also familiar with the nature and objectives of the program, suggesting a high level of active awareness. Of these, around 30% were motivated to actively participate in program activities. Reasons given by farmers for being motivated to participate included:

'I pay levies to all three cooperating R&D corporations and spending my levies in a coordinated way is great! It addresses the issues I need altogether for a damn change.'

'We have needed something like Grain & Graze for decades. The old commodity approach is tired. The productivity gains in grain have really slowed down. We need to look at the interactions in mixed systems to take the next step forward. There is nothing else like Grain & Graze.'

Discussion regarding the success factors and barriers to participation and adoption follow in a later section suffice to say here that in addition to the many recorded reasons for farmer motivation, novelty played some part in the Grain & Graze program.

Participation

The original participation target of 15 000 was based on an intention of supporting Change-on-farm activities intensively in the nine participating Grain & Graze regions as well as to a lesser extent in regions outside. A decision was made following a mid-term evaluation of the program to focus only on the participating regions, which comprised around two-thirds of total mixed farmers. That said, the Management Committee did not agree to lower the target by a commensurate amount (i.e. ~10 000).

Significant discrepancies appear in respect to the AgScan and regional reporting results. The AgScan estimate of 5259 is derived from an extrapolation of the survey results ($n = \sim 2000$), which precludes double counting (i.e. counting a person twice if they attend two events). The regional reports, however, tended to aggregate total numbers of people attending events; that is, the focus of monitoring was on events rather than on individual people. As a result, the total number of 14 510 claimed in final reports of the regions is likely to be an overestimate. The AgScan figure, however, is disputed by many regional participants and is to be considered a minimum.

For those who participated in Grain & Graze events, the experience seems to have been enjoyable, and most likely rewarding. Just over 80% of those attending an event stated in the AgScan surveys that they would attend another. Moreover, the adoption achievement discussed shortly suggests that more than half the participants progressed to adopt Grain & Graze recommended practices. Farmer comments provided in the final evaluation included this:

'I thought we would never top the SGS program, but here in this region Grain & Graze has been the best thing I've been involved in.'

'I really loved having access to other farmers through field days and tours and opportunities to discuss practices and receive their feedback.'

Adoption

During the life of Grain & Graze, the key practices recommended (Table 1) were adopted by a total of 26 009 farmers, although most were not able to attribute the change to any specific reason, such as participation in Grain & Graze. The 2008 AgScan survey, however, identifies 2358 producers who had stated they had adopted a new farming systems practice due only to their exposure to Grain & Graze, and a further 800 producers who had consciously ceased an unsustainable practice due to their exposure to Grain & Graze. This later form of adoption, or 'disadoption' (Vanclay 2004; Pannell *et al.* 2006), is seldom considered in adoption surveys and was a welcome part of the evaluation process (Read and Petersen 2008). The practices adopted are outlined in Table 5 and summarised in Fig. 3.

Cost-benefit analyses of the program showed that the practices adopted in Grain & Graze contributed to an overall

Table 5. Key practices adopted in Grain & Graze

Key farm practice adopted (Read and Petersen 2008)	No. of regions where adopted
Grazing cereals (ha)	5
Containment areas for grazing sheep (head)	1
Fodder budgeting principles (ha)	1
Feedlots (head)	1
Improved management of grazing wheats (ha)	1
Pasture cropping (ha)	1
Integrated pest management practices (ha)	1
Improved measurement of feed in the paddock (%)	1
Consideration of pasture persistence when selecting pasture species (ha)	2
Sowing cereals into existing lucerne stands (ha)	1
Assessment of food on offer (ha)	1
Changing enterprise mix to manage drought (ha)	2
Alley farming using forage shrubs such as saltbush (ha)	1
Management techniques aimed at improving biodiversity outcomes (ha)	1
Condition scoring (head)	1
Deferred grazing (ha)	1
Grazing cropping land (ha)	2
Sowing of pastures and forage crops (ha)	1
Subtropical perennial grasses (ha)	1
Sowing fodder shrubs (ha)	1

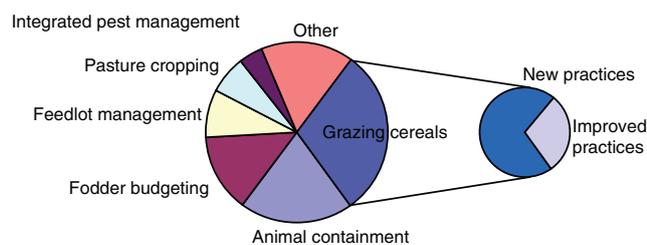


Fig. 3. Proportional adoption of key practices in Grain & Graze.

achievement of a 9% average increase in farm profit (Read and Petersen 2008). This went some way to achieving the economic goal of the program (a 10% increase). The environmental and social impacts of adoption were more difficult to quantify, although Read and Petersen suggest that 95% of the practices adopted have some positive environmental impact, while some positive contribution to the social objective can be found in many of the farmer comments:

'Adoption of the Grain & Graze practices means greater resilience of farming in South-West Victoria.'

'The regional Grain & Graze program has created tools and products to enable farmers to be more socially responsible.'

Discussion

Was the strategy successful?

The response to the achievements of Grain & Graze was mixed. The accomplishment against the targets (Table 4) can, and did, mean different things to different people, depending on their personal experience with Grain & Graze as well as their view about goals and targets in general. Rickards and Price (2009) found that some of these differences were manifested in different dialogues about the program. Different discourses could be discerned between those viewing the program as a professional entity and those that saw it as a revolutionary process. Those engaging in the professional discourse tended to see the program as having not lived up to their expectations on the grounds that the participation and adoption targets were not met:

Individual Research and Development Corporations indicate moderate satisfaction that their expectations of achieving targeted outcomes have been met based on recorded information at the time of the Final Evaluation. It is noted that further and ongoing targeted benefits may accrue to the program in time to come (Read and Petersen 2008).

Those engaging in the revolutionary discourse tended not to judge the program's achievement through the criteria of targets, but rather on whether it put into place those factors that will generate longer-term change. Indeed, this group tended to have negative views about the role of targets in research and extension programs:

Frustration was expressed that the potential significance and insightfulness of G&G had been devalued by the imposition of inappropriate targets that make it more like 'every other RD&E program' (Rickards 2008).

Attaining an adoption rate on over 3158 farms within a 5-year period off a platform of around 5000 active participants would appear to the authors to be a resounding success. Although this is significantly below the target of 6800, the Read and Petersen (2008) evaluation records a return to investment of 3.4:1. This is favourable when compared with the average rates of returns observed by Alston *et al.* (2000) from a sample of over 1800 cost-benefit analyses undertaken in agricultural R&D initiatives. The authors also note that the

Grain & Graze evaluation was cautious not to include wider adoption of Grain & Graze recommended practices where the farmers could not attribute the adoption to any particular source, despite the likelihood it may have contributed to the general, diffuse and multiple influence that often takes place in the adoption process (Carney 2002).

What facilitated success?

Read and Petersen (2008) found in their evaluation of Grain & Graze that participants attributed 29 factors where extension in the program was considered successful. In Table 6, the authors have categorised these into seven classes: locally relevant; soundly planned (yet adaptive); credible; satisfying; holistic; grounded; and innovative. Each of these is discussed briefly below.

Locally relevant

The notion of 'relevance' is socially subjective (Boersma and Mutsaerts 1995). However, in the context of Grain &

Table 6. Success factors in the adoption of Grain & Graze recommended practices

Success factors identified by Grain & Graze participants (Read and Petersen 2008)	Category of success factor
Relevant localised research Focus on risk management	Locally relevant
Receptive 'target audience' (e.g. farmers changing enterprise wanting new information, or following a 'drought' of extension)	
Responsiveness to client needs and opportunities	
Providing response strategies for drought	
Anticipation of profitable outcomes	Soundly planned base/adaptive
Program capacity to respond to change	
Investment leverage	
Initial project planning	
Effective engagement of partners	
Flexibility in provision of expert services	
Involvement of agribusiness	
Inter-regional information exchange	
Continuity and commitment of staff and capacity within the regions	
Skills of the coordinator	
Use of an 'adoption model'	Credible
Credibility with farmers	
Clearly identified and credible leaders	
Effective team processes (leadership, coordination)	
Effectiveness of the Grain & Graze brand	
Independence of new information	
Farmer pride and satisfaction	
Passion of people involved	
Enjoyable processes	
Capacity to manage at a systems-based level	
Staff with systems-based thinking/capacity	Holistic
Building on preceding projects	
Enhancing existing producer networks	

Graze extension feedback it fell broadly into two camps: (i) relevance to local conditions that are tangible, such as land suitability; and (ii) relevance to local and personal conditions that are intangible, such as personal goals and preferences. Contextualisation of research and extension is critical to successful uptake of research results (Gibbons *et al.* 1994), although it can have ethical implications in respect to running centralised management systems (Scott 2003), or in the case of Grain & Graze, running national research programs. Devolving responsibility to regional teams to direct local research and extension activities while expecting these to be consistent with the broad investment models outlined in the Change-on-farm strategy resulted in some tension between local and national participants (Rickards 2008). However, where the tension was resolved in favour of providing a sense of local ownership, success was recognised (Read and Petersen 2008). These tensions, and their resolution, are common in participatory research endeavours, and well documented (i.e. Roling and Wagemakers 1998). The concept of empowerment which underlies many devolved extension strategies has been considered a powerful success factor particularly in adoption of practices that have a sustainability context (Bartholomew and Bourdon 2002).

Soundly planned yet adaptive

Grain & Graze participants recognised that a strength of the program's extension process was its access to sufficient resources to support everything outlined in the Change-on-farm strategy. Twelve percent of the program's budget was directed towards the strategy, with an additional 4% towards communication activities (A\$2.3 million in total over 5 years). The allocation of such funds was enabled by sound planning and considerable time taken to engage industry partners in the investment process. Here, the identification of targets proved a valuable justification for adequate resource allocation. Funds provided to regions for extension activities were discretionary, within the constraints of working with the Change-on-farm models and providing confidence that activities would contribute to the attainment of participation and adoption targets. This meant that regions were able to engage both public and private extension providers as required, and meet farmer demands for additional, unplanned events where the need arose. The approach enabled the considerable flexibility and adaptive management requirements recognised as important in effective extension (Jiggins and Roling 2000; van de Fliert 2003), and this was acknowledged by many Grain & Graze participants. Nonetheless, issues of planning and targets were also considered by some to be a limitation to the effectiveness of the program's extension efforts, and this is discussed in the corresponding section on *Limitations to enhanced adoption* (see below).

Credible

The need for credibility in agricultural extension has long been recognised (Gorrdard 1993; Vanclay 2004), although like the term 'relevance' (see above), it is a subjective concept, with credibility being in the eye of the beholder (Rieh and Danielson 2007). This does not simply apply to credibility in

the extension context, but also in the notionally objective science context (Barrow and Conrad 2006). In Grain & Graze extension, the concept of credibility related to the skills of the extension personnel and Grain & Graze leadership, mainly as perceived by farmers, the basis in sound extension theory and practice, and association with other factors perceived as credible – in this case the Grain & Graze brand.

Satisfying

Enjoyment was considered an important factor in participating in Grain & Graze events, and more importantly in feeling a sense of belonging in the program's farmer network. This is consistent with the findings of successful participatory processes (Wortmann *et al.* 2005; Keenan 2007). The notion of enjoyment suggests that satisfaction comes not simply in a program offering satisfying solutions, but also in offering satisfying processes. Klandermans (1993) suggests that people stay with movements where these offer a satisfying experience; and hence the high level of farmer demand to maintain ongoing association with Grain & Graze noted in the final evaluation (Read and Petersen 2008), suggests that the program met a range of satisfactions along the scale of Maslow's hierarchy of needs (Maslow 1943).

Holistic

A fundamental differentiation of Grain & Graze from other agricultural RD&E programs in Australia was its focus on mixed-farming systems, exploring the interrelationships of crops, pastures, animals, people and resources (Grain and Graze 2003). This was a break away from traditional commodity-by-commodity approaches to program management, an approach that has been criticised in Australia and in other countries, particularly in light of sustainability concerns (Monk 1999; Pearson 2005). Farmers involved in Grain & Graze considered the value of the mixed-systems approach from both an administrative and production perspective:

I pay levies to all three co-operating R&D corporations and spending my levies in a coordinated way is great.

We have needed something like G&G for decades. The old commodity approach is tired. The productivity gains in grain have really slowed down. We need to look at the interactions in mixed systems to take the next step forward.

Systems-thinking, without being defined, was considered a critically important skill for extension personnel. As the program progressed, however, the authors sensed that this became less about putting the different commodity enterprises together than being about meeting social and environmental expectations in addition to, and in some cases at the expense of profit (consistent with Vanclay 2004).

Grounded

Continuity and familiarity were considered by some participants as important factors in adoption, and while these terms are vague, they have relevance to credibility (Fitch 2006; Kaye 2007). Participants also valued the sense of comfort and

confidence, a concept distinguishable from the sense of credibility (Papadopoulou *et al.* 2000). Building on existing activities and networks had been a strategy to initiate activities quickly in Grain & Graze; however, this required a shift in focus for groups previously concerned with a single-commodity, typically cropping in this case. The authors observed that the farmer participants, who worked across commodities in any case, adjusted to this shift more readily than the extension personnel, most of who were trained in only one commodity. The issue of capacity is dealt with later in respect to the limitations to adoption.

Innovative

The issue of extension methodology was considered important by some Grain & Graze participants. In particular, the focus on farmer-to-farmer techniques involving storytelling (Snowden 2002; McGuckian 2008), case studies (Gerring 2007), farmer-to-farmer mentoring (Olubode-Awosola and van Schalkwyk 2006) and inter-regional visits were considered pivotal in constantly exposing participants to ideas, allowing them to emerge, evolve, cement and become reinforced over time. Some of these techniques were used because decisions in mixed farming are considered to be complex (McGuckian 2008), requiring emergent processes rather than paternalistic, top-down ones (Ison and Russell 2000).

These factors are not intended to add to the adoption typologies that abound. Indeed, most of the factors fall within the categories of relative advantage (credible, satisfying, holistic, grounded, and innovative) and trialability (locally relevant, soundly planned yet adaptive) (Pannell *et al.* 2006). Of surprise to the authors was that the role of profitability had not been considered in responses by participants; surprising because the economic component of the Read and Petersen (2008) evaluation showed that grazing cereals had proved by far to be the most profitable of the recommended Grain & Graze practices (up to an increase of 19% per annum), and was also the practice most commonly adopted. This would suggest that many respondents considered profitability a given in their responses, but that in itself was not enough.

Limitations to enhanced adoption

Barriers to adoption is a well trodden field of extension study (e.g. Vanclay 1992; Drost *et al.* 1996; Shulman and Price 2000) and requires little elaboration here. Suffice to say, Grain & Graze participants were asked in the final evaluation (Read and Petersen 2008) to identify reasons which limited further adoption. The responses are listed in Table 7. All of these limitations have been identified elsewhere, however, within the context of mixed-farming systems and the challenges to adoption, the authors consider the issues of complex decision making and regionalised extension capacity worthy of brief comment.

Adoption challenge 1: complex decision making

Grain & Graze supported a social research project which analysed the research and extension process both in theory as well as through observation of program activities. Fourteen research discussion papers (McGuckian 2008) were prepared during the

Table 7. Barriers to adoption of Grain & Graze recommended practices

Identified barriers (Read and Petersen 2008)

Viable options – difficult match of enterprise mix with seasonal variability
 Preference for more profitable crop options
 Change to work patterns/lifestyle
 Marginal benefits considered too low
 Drought and seasonal variability
 Short time period
 Time required to develop information, tools
 Farmers not recognising that change is required
 Staff turn-over, credibility of new staff
 Low staff full time equivalent contributions
 Funding not commensurate with the scale of outcomes expected
 Research structure and linkage to management
 Extension and information being relevant (e.g. at field days) to value farmer time
 Excessive administration reducing coordinator capacity
 Partner interest in research rather than extension
 Limited capacity for extension
 Flexibility of program design (for emergent opportunities)
 Entrenched traditional values and practices
 Farm finance – limiting ability to adopt
 Limited systems management understanding and capacity (staff and producers)
 Inconsistent information, messages
 Information overload
 Changing conditions (markets, climate)
 Regulations that limit options
 Changing expectations external to the region
 Low rural population density (less people to engage)
 Relevance of options to low rainfall areas (more options for higher rainfall areas)
 Lack of economic assessment of options

life of the project, and from these lessons for Change-on-farm activities were distilled. A recurring theme across the papers was the issue of complex decision making, a characteristic common to the management of multiple enterprises (i.e. mixed farming), which appears to dampen rapid adoption. In essence, many of these papers argued that there is no single way in which decisions are made because there is no one type of decision, and the context for all decisions changes from individual to individual. Three forms of decision include:

Simple decisions

The easiest decisions are simple. There are a few variables and there is a clear right or wrong answer. For example, deciding how much drench to give a 45-kg wether may be considered a simple decision. The farmer would refer to the label recommendation and drench accordingly. Throughout the day, many simple decisions are made with little conscious thought.

Complicated decisions

When several variables are involved, but the relationships between variables are clear and well documented, a decision can be considered complicated. Deciding on a pest control program in a wheat crop could be considered complicated. Significant

expertise and experience are required, but there is information on relationships and responses available that the expert can use to make a decision. Again, many complicated decisions are required on mixed farms and are often made by the farmer with assistance from a trained and experienced agronomist.

Complex decisions

When several complicated decisions come together and interact and the variables and trade-offs cannot be quantified or weighed against each other, the decisions may be considered complex. For example, deciding how many livestock to run on a farm, which also has a range of crops, is a complex decision. Although a theoretical optimum number of livestock could be calculated using a modelling approach, many variables would remain unaccounted for such as the effect on the environment, the need to manage labour, the impact on recreation time, the increased risks, and long-term price forecasts. The number of variables is very high and cannot be modelled.

The theory on decision making (e.g. Snowden 2002) suggests that complex decisions are uniquely contextualised, take time in evolving, cannot be easily demonstrated (i.e. lack the trialability characteristics discussed by Pannell *et al.* 2006) and require processes sympathetic to iterative learning. Building on the theory proposed by Snowden, McGuckian suggests that we can improve the quality (but not the timing) of decisions by 'storytelling'. The theory recognises that past experience is very important, although this tends to make complex decision making conservative. Such processes do not easily lend themselves to timeframes, a point of immense relevance in any discussion about the validity of adoption targets in extension programs.

Adoption challenge 2: regionalisation and the capacity to facilitate change

While the extension approach described in the Change-on-farm strategy had a theoretically sound foundation, building on models described by Coutts and Roberts (2003), many regions had difficulty in fully embracing the concepts. Some regional coordinators admitted they were not fully aware or appreciative of the extension theories contained in the Change-on-farm strategy. Without this awareness, understanding and, more importantly, discussion around the potential benefits of adopting new approaches, modification to traditional extension methods, such as those advocated by McGuckian (see above), were not easily entertained. Compounding this reluctance, the ambitious adoption targets imposed on each region took the focus away from the underpinning theories and approaches; indeed, some regional coordinators thought the Change-on-farm strategy was simply about the targets and not the theory that might help reach the targets.

The consortium of extension delivery agents and their contribution to Grain & Graze was different in all nine regions (Table 8); consistent with the program's emphasis on devolution as a means of maintaining local relevance (Alexander 1992; Lockie and Vanclay 1997; Lawrence 2004). Three regional programs were led by State agencies, three by Catchment Management Authorities and three by farming systems groups (Price 2008). Each member of the regional consortium brought their own individualistic approach to extension. Partnerships

Table 8. Contribution of various partners to the regional delivery of Grain & Graze

Region	State agencies	Catchment management authority	Research institutes (e.g. universities, CSIRO)	Farming systems groups	Consultants
Avon (WA)	Major ^A	Minor	Minor	Minor	Moderate
Border Rivers (NSW/Qld)	Major	Major ^A	Moderate	Minor	Moderate
Central-West/Lachlan (NSW)	Major ^A	Major	Minor	Moderate	Minor
Corangamite Glenelg Hopkins (Vic.)	Minor	Minor	Moderate	Major ^A	Major
Eyre Peninsula (SA)	Major	Moderate	Moderate ^A	Moderate	Minor
Mallee (Vic./NSW/SA)	Major	Minor	Moderate	Major ^A	Moderate
Maranoa/Balonne (Qld)	Major ^A	Major	Moderate	Minor	Moderate
Murrumbidgee (NSW)	Major	Moderate	Moderate	Major ^A	Moderate
Northern Agricultural Region (WA)	Major	Minor ^A	Minor	Major	Major

^AContracted lead agency.

with strong ties to research agencies tended to focus more resources on delivering extension activities suited to simple or complicated decisions (McGuckian 2008). In contrast, the farming systems groups that maintained flexibility and control over their resources and were not as constrained by institutional policy were able to operate more effectively at the systems level. Such policy constraints were particularly important in relation to one-on-one discussions and individual farm visits, i.e. occasions when the whole-farm implications of adopting new practices can be worked through over time.

In the formative stages of Grain & Graze regional delivery agents could not see a relative advantage to them by embracing new extension approaches or by changing the way they conducted their activities (Chudleigh 2005). Without this internal motivation for change, much of the delivery defaulted to previously used approaches, better suited to simple or complicated extension practice. Over time some activities were more eagerly embraced by producers than others and this appeal could not be accurately predicted when the regional programs were initiated. This differential appeal can be described as a form of 'random traction' and to capitalise on the emerging opportunities and momentum, resources and approaches needed to be highly responsive. While discretionary funds from the Change-on-farm strategy could meet some of the demand for flexibility, the partnership arrangements at the regional level made the wider remobilisation of resources very difficult.

The capacity of the regional delivery agents to operate at a systems extension level varied from region to region. As a triple bottom line systems-based program, Grain & Graze needed to align with systems extension theory, yet much of the traditional theory fails in relation to sustainability and complex decisions (Blacket 1996; Ison *et al.* 1997). Techniques such as farmer trialling, facilitated storytelling, mentoring, presentation of the potential negative consequences of a practice and use of multiple delivery agents such as consultants, merchandise agronomists and existing farmer networks had to be embraced as an expectation of the Change-on-farm strategy. Very few regions had experts in all of these extension modes, although in every region there were experts with experience in at least one method. In this multi-dimensional milieu, however, new actors

inevitably come to the fore, primarily farmers and third party agents, and these actors placed as much demand on the local extension system to innovate as did the central managers of the program. In some cases, the role of the local extension agents had to adapt from being deliverers of extension to supporters of others delivering extension. This, on occasion, exacerbated tensions between the regions and central managers already initiated with the imposition of adoption targets (Rickards and Price 2009), with issues of ownership, independence and control typical of conflicts common to regionalised processes (Martin 1997).

Are targets appropriate in complex systems extension?

Accountability is here to stay (State of California, Little Hoover Commission 2008). Accountability, however, is not without dilemma, whether about its meaning, meaningfulness, legitimacy, political rhetoric or ethical and legal binds (Callahan 2006). It is a normative practice of modern RD&E programs (Gibbons *et al.* 1994; Murray 2000). Devolving control of RD&E practices within the context of regionalism exacerbates some of these dilemmas by introducing further paradoxes of centralised processes of decentralised empowerment (Wilder and Lankao 2006). The resource demands required to support institutional structures adequate to sustain participation become highly problematic (Eversole and Martin 2005). It is in contestation-charged environment of decentralisation (Lawrence 2004) that the adoption targets associated with Grain & Graze must be considered. In doing so, we ask the questions: were the targets appropriate? Were the processes appropriate? Were the resources appropriate?

The targets in Grain & Graze were enormously ambitious (Read and Petersen 2008). Originally set to be met in 2015 (Grain and Graze 2003), the adoption target of 6800 was brought forward to 2008 in line with the program duration and hence the availability of monitoring and evaluation resources. That an adoption level of 3200 was achieved within the life of the program is remarkable, at least by the measure of its attainment of a 3.4 : 1 return on investment (Alston *et al.* 2000). Would this level of adoption have occurred if the pressure was not there to meet the higher target? The question must remain

retorical, however, responses from evaluation interviews suggests that the emphasis on achieving targets, while often divisive, was a very strong motivational factor to direct attention towards facilitating change (Read and Petersen 2008).

When the adoption target was set for 2015, it was based on analyses of the adoption of simpler farming technologies (Grain and Graze 2003). It did not take into account the timeframes required of more complex farming systems practices (Ison *et al.* 1997) or highly participatory processes (Murray 2000). Establishing timeframes for complex decisions is highly problematic (Beratan 2007). From a cognitive perspective alone, the process for learning complex practices requires repeated exposure to new ideas over time before those ideas are consolidated into long-term memory and integrated into schemas (Dagenbach *et al.* 1990). Certainly some people learn quickly, depending on their context and circumstance, and this inevitability might be taken into account in target setting. However, who these people are, how many there are, and whether they are inclined to participate in RD&E programs is difficult, if not impossible, to judge, and so intelligent guessing based on past experience (Haskell 2001), becomes an unavoidable part of the target setting process.

Bringing into question the appropriateness of the quantification and timing of targets in an environment of intelligent guessing is nonetheless impractical, particularly where there is evidence to suggest that improbable targets can result in improbable achievement. What should be eliminated is not so much the notion of targets in extension, but rather the unproductive contestation around setting and then delivering against targets. This returns us to the second question, about appropriate target setting processes. In processes of true empowerment, negotiation around goals and targets must be mutual (Wenger 1998). This was not the case in Grain & Graze, where the targets were established by the central partners, with the expectation that regions would shape their RD&E activities in ways appropriate to achieving the targets. It is not uncommon for people or organisations to sign onto impossible targets simply to secure resources, and do so in good faith and with every intention that they will do everything possible to meet their obligations. However, as time progresses and the reality of meeting targets becomes a question of payment or non-payment, contestation can emerge as it did in Grain & Graze, and the issue of targets gets brought into question. Herein lies another paradox. Building shared trust and understanding, particularly to the point where different parties can bring their past experiences to the table in a process of shared intelligent guessing, takes time (Beratan 2007); time that some parties see as better spent achieving targets rather than setting them.

Even with time saved by not going through a phase of mutual target setting, or perhaps because of it, Grain & Graze struggled to fully embed the Change-on-farm theory into the regional extension methods. Some of the approaches espoused were new, requiring the regional delivery agent to gain confidence that these approaches were the most appropriate. Extension theory suggests this confidence building needs to be achieved in a non-threatening learning environment (Fell 1997) and will take time (Nicholson *et al.* 2003). To create this environment was difficult given the ambitious targets set for the program and

the short time frame for delivery. Regions simply could not afford to experiment with new approaches and fail with the contractual expectation to deliver.

Conclusions

The dual nature of Grain & Graze's Change-on-farm strategy, dealing with both targets and process, resulted in many participants focussing more on the targets than on the journey towards adoption farmers embarked upon. For many farmers, that journey continues, in their own time at their own pace irrespective of the formal opportunities for learning that are put in place by programs such as Grain & Graze. This poses enormous challenges to extension that cannot simply be rectified by the adaptation of extension models such as the SGS or CVCB models. For a start, it requires considerable resources to continually repeat learning steps for some while providing new opportunities for others as they progress. Experience in Grain & Graze suggests that repeating old steps is not only expensive, but can be unrewarding for the extension personnel involved, who want to progress along themselves with the farming leaders. Moreover, pressure can be applied by funding organisations to continuously see new things put in place for their funds.

Did Grain & Graze fail as a program because it did not reach its target of 6800 farmers adopting recommended practices? The authors, wracked as we are with our burdens of conflict of interest, suggest not. The final evaluation of the program (Read and Petersen 2008), also suggests otherwise, pointing to a return on investment of 3.4 : 1 as well as a host of unintended benefits achieved such as capacity building. Others, including regional participants and central funding agencies alike, have subsequently considered the program a success.

What appears to have happened over time is an uncoupling of the notion of targets as a motivator of success and targets as a measure of success. Murray (2000) describes something similar when he points to the limitations of traditional evaluation processes when applied to emergent participatory extension approaches. At that time he suggested that alternative evaluation approaches, taking into account the differentials between stakeholders, which are essentially differences in power, needed to be developed so as to provide a more complete answer to the question of success. This paper would concur, but it would also suggest that in an environment of participatory RD&E, not only should targets as a motivator be mutually negotiated, but so should the process of evaluation.

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