Extension through Grazing BMP: an integration of production and natural resource management

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Abstract. The Grazing Best Management Practices (BMP) program is a voluntary self-assessment program that allows graziers to benchmark their current management practices against industry standards. Graziers can identify opportunities to achieve best management practice. In the Burdekin Catchment, the Department of Agriculture and Fisheries (DAF) supports Grazing BMP with an extension project that has a whole-of-business approach to achieve reef water quality outcomes. The DAF extension and support project has documented evidence of both intent to change and actual practice change as a result of the extension activities across 272 beef businesses. This is in contrast to responses to regulatory programs such as the Environmental Risk Management Plan (ERMP) requirement previously applied in the region. Even though 265 beef businesses in the Burdekin Catchment completed the ERMP requirement there is no documented evidence of intent or actual practice change taking place to improve reef water quality using this legislative approach.

Keywords: reef, grazing, Burdekin, sustainability, practice change

Background to the Grazing BMP program

In the Burdekin Catchment, the Department of Agriculture and Fisheries (DAF) supports Grazing Best Management Practices (BMP) with an extension project that has a whole-of-business approach to achieve reef water quality outcomes. Cattle grazing properties greater than 2000 hectares are considered an environmentally relevant activity in a priority catchment and the Burdekin Catchment is a priority catchment (EPA 1994). This resulted in an increased focus on the Burdekin Catchment in regards to reef regulation. Prior to the implementation of Grazing BMP a DAF extension and support project had been well established to provide tools to assist graziers to meet their legislated ERMP requirements.

Grazing BMP evolved from an idea developed by graziers in Central Queensland who were frustrated by the pressures placed on the grazing industry and wanted to duplicate the success of BMP programs implemented by other industries such as cotton and grains (About Us 2015). A producer reference group was formed and with the assistance of external consultants and the Department of Agriculture and Fisheries (DAF) the technical content of the Grazing BMP program was developed. A partnership was formed between Fitzroy Basin Association, Agforce and DAF to deliver the program to beef graziers in Reef Catchments as an alternative to the regulatory process of ERMPs. The Department of Environment and Heritage Protection (EHP) provided funding for delivery of Grazing BMP in priority catchments, with Phase I beginning in 2013 (About Us 2015). North Queensland Dry Tropics (NQDT) is a delivery partner in the Burdekin Catchment to achieve targets set as a result of EHP funding provided.

Grazing Best Management Practices (BMP) is an online, self-assessment tool that participants use to benchmark their current practice against an industry-developed set of standards. These standards have been verified by a producer reference group and are based on industry experience and the best available science. The program's five modules are grazing land management, soil health, animal production, animal health and welfare, and people and business. The program has a number of benefits to the beef industry. It provides industry-wide data on management practices that can be used by Agforce to demonstrate good environmental stewardship and show the community and consumers that their food is being produced ethically and sustainably. As well as benefits to industry, graziers' businesses benefit due to the opportunities available to analyse their management practices and in essence do a 'health check' of their beef business. Graziers then have direct access to resources to upskill, to implement change and to improve aspects of their business where required. A number of areas identified for improvement include property mapping, understanding the importance of soil health, workplace health and safety and succession planning.

There is a distinct difference in graziers' attitude to being involved in a voluntary program such as Grazing BMP and the opportunities available in regards to extension. After the introduction of the ERMP requirement, graziers led protests in Charters Towers and also arranged to meet with the then Environmental Minister Kate Jones to communicate their dissatisfaction (Galloway 2012). Graziers made comments such as the 'regulations were too restrictive' and 'punishing graziers' (Galloway 2012). Some graziers even threatened to deliberately fail to submit the

plans as an act of civil disobedience (Hall 2010). In contrast many graziers who have been involved in Grazing BMP state that everyone should do it as it has benefits for the industry and their businesses. For example, chairman of the Dalrymple Landcare Committee (DLC), Doug O'Neill, states that 'Grazing BMP makes people aware of the issues they need to attend to on their property' and that the program encourages graziers to change their practices for the betterment of the grazing business and for the reef (Miller 2016).

The following Grazing BMP Project information and data are for the period for 1st July 2013 to 30th June 2014 and has been drawn from the web site data base (Taylor 2014). Performance against project targets is summarized in Table I. Over half of the businesses that undertook a Grazing BMP self-assessment had not completed an ERMP. There is no corresponding evidence that those that did complete an ERMP implemented any practice change. There is anecdotal evidence that a number of businesses hired consultants to complete the ERMP. This would suggest no intent to implement practice change.

Table 1. Performance against Grazing BMP Delivery Targets 2013/14

	Targets			Delivered		
	Burdekin	Fitzroy	Total	Burdekin	Fitzroy	Total
Total modules completed	500	1000	1,500	538	1251	1789
Soils and Grazing Land Management modules completed	200	400	600	215	650	865
Modules delivered as complete program (grazier completing 5)	100	200	300	445	170	615
Businesses undertaking the complete program (5 modules)	20	40	60	89	34	123
Modules completed by Burdekin businesses without ERMP	150	NA	150	270	NA	270
Business accredited (audit)	10	20	30	5	5*	10

DAF Extension and Support Project

The Grazing BMP and Extension Support Project is an on-going project that was established initially in 2011 and aims to encourage beef producers to adopt practices that result in productive and profitable grazing systems that also have improved water quality outcomes for the Great Barrier Reef. The project has provided all extension support required for the delivery of Grazing BMP in the Burdekin Catchment. By undertaking a Grazing BMP self-assessment a grazier completes a situation analysis of their management practices and can then develop a plan to implement the practice change required to ensure best management practice is in place. The project delivers extension services to producers across four major themes – grazing land management, animal production, economic services and enhanced extension products.

Distinct from the ERMP process, as well as enabling change the Grazing BMP and associated extension has a whole-of-business focus rather than a singularly grazing land management focus. The premise for this is that all aspects of management in a beef business are interdependent. The animal product produced and the long term sustainability of the beef business are reliant on each other. Best management of reproduction and genetics allows a reduction in stocking rates, leading to better grazing land condition, and a higher quality diet available to cattle. The extension support project provides the grazier with access to the resources and technology available to implement on-ground change. The project was required to achieve a number of targets, based around engagement, improved capacity, intention to change and on-ground practice change. Evaluation surveys, confidential case studies and narratives were undertaken to evaluate project impact against these targets.

Results achieved from the Grazing BMP project

All DAF's specific targets for the 2011-14 funding period within this Burdekin catchment project were met and exceeded (Table 2). The project's target of 80% Knowledge, Attitudes, Skills, and Aspirations (KASA) improvement and 50% intention to change have been met and exceeded. These values were calculated from the responses provided on activity feedback sheets recorded in the monitoring and evaluation Qual DATA platform.

Table 2. Performance against Extension Delivery Targets 2011 - 2014

2011-2014	Target	Achieved
Producers engaged	900	1937
Improved capacity of producers (KASA)	80%	81%
Intention to change management practices	50%	60%
Quantifiable on ground practice change	>25%	76% (C.I. = 10.73 at 95% confidence) (65-87% real change)

Beef producers from 64 properties completed a practice change evaluation survey. A mid-term evaluation was conducted in 2013 and a final evaluation conducted in 2014. These 64 businesses represent graziers who were engaged by the project from 2011 to 2014. The finding of the evaluations represents the total number of participants with a high level of confidence (margin of error of 10.73 at 95% confidence).

The project's target of greater than 25% of participants achieving real documented change was greatly exceeded. Seventy six percent of properties who completed the practice change evaluation said "yes" they had had the opportunity to do something new or different as a result of attending activities. The project is 95% sure that 65-87% of the population (beef producers who undertook activities) achieved real change.

Benefit-cost analysis

The BCA (Moravek 2014) showed that for every $1 spent, $3.65 was received in private industry benefits. Net present value was also positive at the default gross margin improvement of $12.25/head (Table 3). At the lower and higher confidence levels of adoption, BCA ranged from 3.14 to 4.17 (Table 4 and Table 5).

Table 3. Results of the BCA

Results (Average)	
Adoption Rate	76.1%
Present Value of Benefits	$9,244,797
Present Value of Costs	$2,530,478
Net Present Value	$6,714,319
Benefit-Cost Ratio	3.65

Source: Moravek 2014.

Table 4. Results at lower adoption

Results (Lower Adoption Level)	
Adoption Rate	65.3%
Present Value of Benefits	$7,933,252
Present Value of Costs	$2,530,478
Net Present Value	$5,402,774
Benefit-Cost Ratio	3.14

Source: Moravek 2014.

Table 5. Results at higher adoption

Results (Upper Adoption Level)	
Adoption Rate	86.7%
Present Value of Benefits	$10,541,610
Present Value of Costs	$2,530,478
Net Present Value	$8,011,132
Benefit-Cost Ratio	4.17

Source: Moravek 2014.

Why the Extension and Support Project was successful

There have been a number of reports written about the complexities of the barriers to participation and practice change. These barriers can be summarised as situational, for example, lack of time; institutional, for example, determined by government policy rather than relevance to a grazing operation; and/or dispositional, for example, negative experiences in the past or too many workshops (Andrew et al. 2005). Specific barriers to practice change to improve reef water quality include rules and regulations, perceptions of bureaucracy and

tensions between bureaucratic goals and graziers' goals (Andrew et al. 2005). Prior to Grazing BMP and the Extension and Support project, extension support was provided in regards to the technical requirements of the ERMP, however, many graziers were reluctant to participate in something they viewed as bureaucratic and discriminatory – therefore, a dispositional barrier.

As well as barriers, adoption of practice change is influenced by how graziers learn. Graziers are motivated to learn for a number of reasons, including improved business efficiency and profitability, improved business viability, improved skills and knowledge and personal development (Andrew et al. 2005). Lankester (2013) reported that graziers prefer informal learning opportunities such as their own experiences and observations or shared experiences of their peers and family members. Finally, graziers are more likely to participate where they are interacting with people they trust and have relationships and community networks with, including family, peers, extension officers and landcare groups (Andrew et al. 2005).

The Extension and Support project prevailed in regards to institutional and dispositional barriers by ensuring targeted extension was relevant to grazing best management practices and utilised a process that was flexible and had a diverse suite of activities offered so that a whole-of-business approach was undertaken. The objective was to improve business productivity and profitability while improving reef water quality. There was a combination of activities undertaken including one-on-one interactions, workshops and field days. This allowed graziers to participate informally and in confidence or interact with their peers.

The level of producer involvement in various extension activities is shown in Table 6. The types of activities that were delivered were:

1. Workshops (small group activities) that related to topics including grazing land management, land condition monitoring, forage budgeting, mapping, Grazing BMP self-assessment pilots, breeding and genetics, nutrition, and soil health.
2. Field days (large groups) with topics including improving productivity from rundown of sown grass pastures, Giant Rat's Tail grass information day, fire management information day, breeder management information days, bull selection field days, breeder management and genetic technologies field day, Clermont Cattleman's Challenge field days, Clermont Show Cattleman's Challenge Taste Test, buffel grass run-down, and soil health.
3. One-on-one (on property or in office face-to-face interactions with graziers) including a range of topics such as grazing land management related to pasture monitoring, yield estimation, forage budgets, carrying capacity, infrastructure planning for evenness of grazing, weed management and land rehabilitation; and animal production focused on targeted nutrition and supplementation for animal classes, breeder management and application of genetic technologies. Also, animal production recommendations were discussed in relation to the feed base and matching land type capability and condition to animal performance.
4. Property and office visits included the use of tools such as Breedcow and Dynama, BRICK business benchmarking, VegMachine, and pasture photos and budgets within StockTake. A number of landholders were often present on-property and discussion centred about application of R&D to their situation.

Table 6. Producer engagement in activities in 2011-2014

Activity type	Activities	Producer engagements	Total participant engagements
1 to 1 not on property	15	50	54
1 to 1 on property	48	154	202
Field day	30	587	772
Workshop	57	595	791
Forum/seminars	14	206	264
Other	35	246	456
Total	199	1838	2536

Grazing BMP Accreditation and the benefits from extension

Grazing BMP and the Extension and Support project have complimented each other very well. Further evidence of identifiable practice change was through the Grazing BMP accreditation process. Accreditation is achieved by an external review of the grazier's self-assessment information. Accreditation will be the primary tool to verify the information supplied through the program and ensure the credibility of the data collated through the Grazing BMP website (Agforce 2017).

Over one third of the total Grazing BMP module standards have been identified as key-performance indicators– or core criteria. These are based on the specific Grazing BMP practices currently mapped to the Grazing ABCD Reef Water Quality Protection Plan (Reef Plan) and Australian Animal Welfare Standards and specified in the Grazing BMP Core Criteria for Audit

and Accreditation. Core criteria will evolve as the program matures to ensure ongoing relevance and improved outcomes for the industry. Ratification of the applicant's self-assessment information against these core criteria allows those achieving an accredited status, a substantiated claim that they employ sustainable and ethical grazing practices (Agforce 2017).

DAF extension officers have assisted graziers prepare for the accreditation process and worked with them to implement practices such as property mapping, setting up land condition monitoring sites, utilising information such as FORAGE and VegMachine and documenting business and succession plans.

Conclusion

The voluntary, self-assessment structure of the Grazing BMP program has had a more positive effect than a regulatory approach to addressing reef water quality issues. It has allowed a process of ownership, collaboration and communication to develop between government and industry. As a result graziers actively seek to upskill and attend events that will help them attain their business objectives and goals. The resources and technical advice provided by the DAF Extension and Support project has resulted in a high level of practice change. This process has proved to be a more successful means of professional extension and technology transfer in order to improve reef water quality than a regulatory process. Participants are willing to be involved and have had an active involvement in developing plans to make positive changes on their properties.

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