Sub-theme: Research and extension services

COACHING RESULTS IN IMPROVED PASTURE MANAGEMENT PRACTICES

Samantha Flight, Lydia Turner, Symon Jones and Lesley Irvine

Tasmanian Institute of Agriculture, University of Tasmania, Cradle Coast Campus, Burnie 7320, Australia

Corresponding author:
Samantha Flight
Samantha.Flight@utas.edu.au
+61 3 6430 4903
PO Box 3523, Burnie 7320, Tasmania, Australia

This is an applied paper.

2300 Words (excluding tables and references).

March 2019 - ISBN 978-92-990062-8-3
www.ifmaonline.org - Congress Proceedings

COACHING RESULTS IN IMPROVED PASTURE MANAGEMENT PRACTICES

Abstract

The Tasmanian dairy industry is predominantly pasture-based and pasture consumption is a key driver of dairy farm profitability. Due to this, Tasmanian dairy research, development and extension has a focus on increasing the amount of pasture grown and consumed by dairy cows. At an industry level, average pasture consumption has increased from 8.5 t DM/ha to 10.6 t DM/ha over the past 10 years. Coaching is one of the extension methods used in the Tasmanian dairy industry to develop farmer skills in grazing management. Pasture coaching involves the formation of groups of 4-6 farmers by an extension officer who takes on the role of coach for the group. A pasture coaching group meets 8-10 times over a 12 month period. An assessment of the impact of pasture coaching on grazing management skills was undertaken in 2016-17 through pre-coaching and post-coaching surveys along with one-on-one farmer interviews. Pasture coaching resulted in practice change with more people undertaking best management practices including calculating average pasture cover and cow requirements and determining leaf stage. Not only did more people implement some of these best management practices but there was also an increased frequency that these practices were undertaken throughout the course of the pasture coaching program.

Keywords: coaching, extension, farmer learning, pasture management, practice change

Introduction

The Tasmanian dairy industry in the 2016-2017 financial year was comprised of 440 registered dairy farms. The average dairy herds size was 336 cows, averaging 433 kg of milksolids per cow. The Tasmanian climate is highly suited for growing ryegrass

dominant pastures with an average pasture consumption of 10.6 tonne of drymatter per hectare and 74% of energy consumed by cows derived from homegrown feed (Dairy Australia Limited, 2018).

Pasture consumption is a key profit driver in the Tasmanian dairy industry, hence there is a focus on pasture management practices that will improve pasture consumption. Recommended practices include adjusting grazing rotation length based on the leaf emergence rate of ryegrass and calculating pasture and supplement allocations as a result of consistently measuring pasture biomass. Effective implementation of these pivotal, proven practices relies on an understanding of some fundamental biological principles associated with pasture growth and nutritional requirements of dairy cows. Important required knowledge includes the influence of perennial ryegrass leaf stage on pasture productivity, quality and persistence, and how those characteristics influence milk production (Fulkerson and Slack, 1994, Turner et al., 2006, Donaghy et al., 2008). An added understanding of the seasonal effects on leaf emergence rate, as discussed by Cooper (1964), and the relationship between cow nutritional requirements, milk production and body condition gains are needed to accurately calculate pasture and supplement allocations (National Research Council, 2001). As well as understanding these principles, farmers must develop skills to use a pasture measuring tool for measuring pasture biomass and reliably and accurately determine leaf stage (O'Donovan et al., 2002).

There has been considerable research conducted to identify factors that influence adoption of recommended pasture management practices. These range from economic considerations, to ease of understanding, time required, lack of existing knowledge and/or skills, and use of a particular technique or technology (Hall et al., 2018, Flett et al., 2004, Eastwood et al., 2009). Time and effort required to measure pasture and adopt practices has been recognised as one particular barrier along with an aversion to figures, underdeveloped knowledge and skills and the strength of participant relationships – as this can encourage engagement (Eastwood et al., 2009). In addressing the barrier concerning underdeveloped knowledge and skill, the adoption of a year-long pasture coaching process has been shown to be an effective tool in leading to practice change (Flett et al., 2004).

Coaching is the process of incrementally building capacity of individuals by understanding their starting point, their farm system and their learning styles. As highlighted by Turner and Irvine (2017), the role of a coach in a pasture management learning process is to increase the motivation of participants by creation of relationships, and to facilitate knowledge transfer from coach to farmer as well as from farmer to farmer (Eastwood et

al., 2009). The Tasmanian 20.12 Pasture Business Project (2005-2006) successfully demonstrated this type of multifaceted learning and facilitative process supported farmers through a learning phase that resulted in adoption of new pasture management knowledge and practices (Turner and Irvine, 2017; Davey and Maynard 2007). Following the success of the 20.12 Pasture Business Project, the Tasmanian Institute of Agriculture has incorporated the coaching process into the pasture management training program. Groups are formed in a particular region, typically following a two-day pasture management workshop. Participants tend to be both new learners as well as those with some existing knowledge and skills but with interest in improving. To measure the impact of pasture coaching and develop strategies to improve engagement, an evaluation of four pasture coaching groups was undertaken in 2016-17.

Methodology

Four groups were formed and completed the pasture coaching program in 2016-17. These groups were regionally based: Circular Head, Yolla/Wynyard, Central North and North East. Each group comprised of 6 to 8 participants, aged between 21 and 60 years, with the majority of participants classifying themselves as employees. The groups met 8-10 times during a 12-month period with each participant hosting a meeting on their farm at least once. The coaching program was adapted from the Tasmanian 20.12 Pasture Business Project and covered topics including: determining leaf stage, using a plate meter, measuring pasture response to nitrogen applications, developing a feed budget and calculating average pasture cover, pasture growth rate, and cow requirements. The coaching program emphasised planning for seasonal changes in pasture growth and expected management changes required to adapt to the seasonal changes. Each participant was provided with a folder containing worksheets for each meeting. These worksheets provided worked examples of how to calculate key pasture management decision factors such as leaf emergence rate and average pasture cover along with space to input their own data during the meeting. The pasture coach worked through the topic of the meeting using the host farm as the example and facilitated the discussion on how the results of the calculations related to upcoming pasture management decisions.

At the beginning and the conclusion of the coaching period all participants completed a paper-based survey. The survey asked participants to rate their knowledge of (scale of 0-

10) and the frequency they undertook key pasture management practices (not at all, sometimes, or regularly):

- Measure the pasture cover of a paddock
- Calculate the average pasture cover of their farm
- Use a plate meter
- Determine the leaf stage of a paddock
- Calculate cow requirements
- Calculate how much cows are being fed
- Monitor soil moisture

For analysis the frequency statements were converted to numbers (not at all = 0; sometimes = 1; and regularly = 2).

In addition, 8 participants (2 from each region) partook in individual, face-to-face semi-structured interviews prior to the commencement of the program and at the conclusion of the program. At the conclusion of the coaching program, the extension staff involved in facilitating the program recorded their reflections on the strengths and weaknesses of the approach.

Results

Table 1. Implementation frequency of pasture management practices

Pasture management practice (n=23)	Frequency of undertaking practice prior to pasture coaching	Frequency of undertaking practice post pasture coaching	% change
Measure pasture cover of a paddock	0.87	1.36	56%
Calculate average pasture cover of farm	0.61	1.27	108%
Use a plate meter	0.74	1.14	54%
Determine leaf stage	0.88	1.50	70%
Calculate cow requirements	0.75	1.27	69%
Calculate how much cows are being fed	0.80	1.55	94%

March 2019 - ISBN 978-92-990062-8-3
www.ifmaonline.org - Congress Proceedings

All practices were implemented more frequently after coaching, with average implementation of all practices placed between Sometimes and Regularly. The greatest extent of practice change (ie highest % change) occurred for calculating average pasture cover. The most commonly utilised practice at the end of the 12-month period was assessing leaf stage. Importantly, the number of participants not undertaking the practice at all decreased significantly (Table 2).

Table 2. Percentage of farmers answering "not at all" to pasture management practices prior to and post coaching

Pasture management practice (n=23)	% of participants indicating they undertook the practice "not at all" prior to pasture coaching	% of participants indicating they undertook the practice "not at all" post pasture coaching
Measure pasture cover of a paddock	35%	9%
Calculate average pasture cover of farm	52%	14%
Use a plate meter	39%	14%
Determine leaf stage	38%	5%
Calculate cow requirements	50%	14%
Calculate how much cows are being fed	44%	9%

Qualitative interview data was aligned with the survey findings and has provided insights into why and how the coaching method was effective in supporting practice change. Key learnings included: 1) Working in small groups allowed for capacity building in improving pasture management. 2) Consistent and regular coaching throughout the dairy season enabled farmers to gradually gain the knowledge and skills needed to apply recommended practices, when required. 3) Group and coach interactions enabled participant's confidence to grow and allowed them to adapt recommendations and make informed changes which were suitable for their own farm businesses.

The key practice changes the interviewed farmers discussed included: increased use of leaf stage in setting grazing rotation length, using a plate meter to regularly measure pasture growth, and calculating pasture and supplement allocations. Increased precision in grazing management decisions also resulted in more fodder conservation and higher quality for silage made. One of the key changes mentioned by all the farmers was increased use of

leaf stage to help determine rotation length. Farmers acknowledged that prior to coaching this aspect of pasture management was undervalued, 'What you're missing between the 2 and the 3 [leaves], it makes you stop and think…it's a bit frightening really' (Central North Farmer #1). All participants have recognised there are further gains in pasture consumption levels to be made by grazing between the 2-3 leaf stage and since the coaching program have been adjusting their rotation lengths based on identifying leaf emergence rates. North East Farmer #2 had an 18-day round last spring for the first time, previously he would, 'never have done that, would have been too scared…but we'd done the calculations and knew it [the grass] was growing.' As a result of pasture coaching, Circular Head Farmer #3 was working hard to lengthen his winter rotation and investing in additional supplements to help achieve the extended rotation as he could see financial advantages in doing so. Pasture coaching has enabled these farmers to be proactive in adjusting their rotation lengths.

These interviews highlighted the benefit of consistent use of plate meters as part of the pasture coaching process and was helping farmers calibrate their visual assessments; the regularity of coaching sessions and farmer to farmer accountability enabled this practice to become habit. By the end of the coaching sessions farmers could accurately and confidently estimate their pasture covers.

New acquisition of knowledge and skills has led to a greater confidence around timing of shutting paddocks up for silage. For Yolla Farmer #4, this involved closing up more paddocks, rather than keeping them for grazing. For North East Farmer #5 this involved changing the usual method of determining which silage paddocks to shut up in late winter, with feed surplus calculations now guiding the shutting up process. This new approach resulted in greater amounts of silage being made by this farmer, at a more optimal leaf stage resulting in overall higher quality feed.

The regularity of sessions and hands-on approach of the pasture coaching program was key to converting new knowledge into action and on-farm change. North East Farmer #4 emphasised how important this style of learning was for them, 'I can't learn anything from a piece of paper, you gotta show me what to do'. The ongoing contact also allowed questions to be answered and feedback on new skills to be given (e.g. plate meter techniques).

The TIA extension team involved in the recent coaching program summarised the strengths and weaknesses of this extension method (Table 3).

Table 3. Strengths and weaknesses identified with the coaching process

Strengths	Weaknesses
• Allowing farmer – farmer learning to occur enables better farmer engagement. • Worked well with mixed skill level groups where more experienced farmers were able to share practical experience. • Repetitiveness of pasture management principles enables the embedding of knowledge and higher potential of usage by farmer participants. • Working as a group makes best use of facilitator time and invested money.	• Working with a group can make it challenging to tailor learning activities to best suit each individual. • Irregular attendance can hinder the progress as a group, meaning those that don't attend need to catch up. • Faced many barriers to learning and skill uptake – need to identify and work with these.

Discussion

The establishment of coaching groups promoted active discussion of pasture management practices and provided the opportunity to observe how peers integrated these practices into their farm system. Coaching worked particularly well when there were more advanced farmers involved in the groups, farmers who were able to share their practical experience with less experienced farmers.

Results from the pasture coaching survey and interviews found participation in the pasture coaching program improved pasture management practices, such as, determining leaf stage in order to adjust rotation length, measuring pasture biomass to aid in determining cow requirements and allocations. The way a coaching program is facilitated supports the concept of change and transition (Garvey et al., 2017). Whether the change occurring is in thinking, behaviour, attitude or performance, the ongoing consistent approach enables farmers to understand and adapt new learnings for their own scenarios.

Understanding learning styles and group dynamics is an important factor in the successful running of a coaching program. Often, extension is provided with a linear 'top down' approach. An approach that has been shown as somewhat inferior to a participatory 'bottom up' or the one-to-one approach (Black, 2000). Coaching programs utilise a methodology that allows for all three of these learning approaches to be applied as the situation requires.

Where coaching groups had challenges, these were typically about ensuring everyone turned up to every meeting, as absentees made it difficult to progress forward as a group. Some farmers involved in the groups didn't have control over pasture management decisions on their farm and therefore struggled to retain interest. There was also a wide range of literacy and numeracy skills. Given the calculations required for many of the management practices discussed in the coaching program, for example to determine leaf stage, cow requirements or develop a feed budget, some farmers struggled to complete this aspect of the coaching program.

Research has highlighted the complex dynamics of farming systems where farmer co-development of technology and coaching can be used to ensure relevance and value to the industry and ongoing innovation (Eastwood et al., 2009). This approach could be taken to further enhance pasture coaching and enable farmers to own the groups, integrating their ideas and concepts into the planning prior to commencement of the program.

Conclusion

Coaching has proven to be an effective method to achieve improved pasture management skills and uptake of best management practices.

As an extension officer it is important to understand group dynamic, the level of knowledge and the learning types and personalities present. To create a well-functioning group, all these needs should be recognised and addressed. No single method or strategy is likely to be sufficient by itself and if the group is to be a well-functioning entity there will be ongoing requirement for linear 'top down', participatory 'bottom up' and one to one learning styles, (Black, 2000).

Acknowledgements

The authors thank the dairy farmers who participated in the pasture coaching program and provided their feedback and assessment. The authors acknowledge Elizabeth Mann and John Wilson for their development of the original pasture coaching program. The authors would also like to acknowledge Mark Freeman and Alison Hall for editing along with Nathan Bakker for the collation of survey data. Pasture coaching was undertaken within the Dairy On PAR project funded by Dairy Australia and the Tasmanian Institute of Agriculture (Grant Number C100001341).

References

BLACK, A. 2000. Extension theory and practice: a review. *Australian Journal of Experimental Agriculture,* 40**,** 493-502.

COOPER, J. P. 1964. Climatic Variation in Forage Grasses. I. Leaf Development in Climatic Races of Lolium and Dactylis. *Journal of Applied Ecology,* 1**,** 45-61.

COUNCIL, N. R. 2001. *Nutrient requirements of dairy cattle: 2001*, National Academies Press.

DONAGHY, D., TURNER, L. & ADAMCZEWSKI, K. 2008. Effect of defoliation management on water-soluble carbohydrate energy reserves, dry matter yields, and herbage quality of tall fescue. *Agronomy journal,* 100**,** 122-127.

EASTWOOD, C., CHAPMAN, D. & PAINE, M. Farmers as co-developers of innovative precision farming systems. EFITA (European Federation of Information Technology in Agriculture) Conference, 2009.

FLETT, R., ALPASS, F., HUMPHRIES, S., MASSEY, C., MORRISS, S. & LONG, N. 2004. The technology acceptance model and use of technology in New Zealand dairy farming. *Agricultural Systems,* 80**,** 199-211.

FULKERSON, W. & SLACK, K. 1994. Leaf number as a criterion for determining defoliation time for Lolium perenne, 1. Effect of water-soluble carbohydrates and senescence. *Grass and Forage Science,* 49**,** 373-377.

GARVEY, B., GARVEY, R., STOKES, P. & MEGGINSON, D. 2017. *Coaching and mentoring: Theory and practice*, Sage.

HALL, A., TURNER, L. & KILPATRICK, S. 2018. Using the theory of planned behaviour framework to understand tasmanian farmer decision making and adoption of pasture management practices to inform future extension. *13th European IFSA.* Chania (Greece).

LIMITED, D. A. 2018. Dairy farm monitor project tasmania annual report 2016-17.

O'DONOVAN, M., DILLON, P., RATH, M. & STAKELUM, G. 2002. A comparison of four methods of herbage mass estimation. *Irish Journal of Agricultural and Food Research***,** 17-27.

TURNER, L., DONAGHY, D., LANE, P. & RAWNSLEY, R. 2006. Effect of defoliation management, based on leaf stage, on perennial ryegrass (Lolium perenne L.), prairie grass (Bromus willdenowii Kunth.) and cocksfoot (Dactylis glomerata L.) under dryland conditions. 1. Regrowth, tillering and water-soluble carbohydrate concentration. *Grass and forage science,* 61**,** 164-174.

TURNER, L. & IRVINE, L. 2017. Tasmanian dairy farmers and the pasture management learning process: Case study findings on the role of coaching in achieving practice change. *Rural Extension and Innovation Systems Journal,* 13**,** 31.