

Eyre Peninsula Grain and Graze 3 outcomes

INFO

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Key messages

- **Research, development and extension into mixed farming systems in Southern Australia by the G&G3 project confirmed that integration and diversity created by combining cropping and livestock systems generates a high level of complexity.**
- **Significant outcomes of the project include the development of feedbase options, better managed grazing practices, improved risk and decision making skills and an enhanced understanding of the issues and opportunities associated with mixed farming businesses.**

Why do the trial?

Grain and Graze 3 (G&G3) is the third phase of mixed farming investment by the Grains Research & Development Corporation (GRDC) (and previously other industry funders) and covers the low, medium and high rainfall zones in Southern Australia. The project was delivered through group activities, on farm demonstrations and extension from 2014 to 2017. Ultimately the G&G3 program aspired to help farmers and advisors use processes (or tools/packages) to design and manage flexible farming systems, equip them to adapt and respond to changing environments and market conditions and thus to manage risk and generate profits (Figure 1). Three mixed farming issues were identified that if addressed would contribute to the desired outcome, and, in turn, three practices were identified to tackle these issues (Figure 1).

The GRDC provided funding of nearly \$2 million for the National G&G3 program to be carried out over three years across four regions in southern Australia; Eyre Peninsula, East South Australia, South Victoria and North Victoria. A separate but similar project was delivered in Western Australia.

The Eyre Peninsula G&G3 (EP G&G3) project has collaborated with a number of organisations including the Eyre Peninsula Agricultural Research Foundation (EPARF), who provided guidance and support throughout the three-year period, Lower Eyre Agricultural Development Association (LEADA), Eyre Peninsula Natural Resources Management Board (EPNRM), Ag Ex Alliance (AEA), PIRSA Rural Solutions SA and the Low Rainfall Collaboration Group (LRCG).

Research outcomes

Research outcomes from EP G&G3 are described under the three National practices below.

Enhanced grazing of cropped land

Winter crops offer a significant potential feed source that can provide improved returns for mixed farmers. Currently we believe this resource is not being fully utilised and farmers seem to consider the grazing of cereals out of necessity (in a poor season) rather than as a standard practice, hinting at a lack of belief that this can be successfully managed in a good season. Despite nearly a decade of investigation and promotion of grazing crops, there are still many farmers not using grazed cereal crops, but who could potentially benefit from doing so.

EP G&G3 participated in market research to understand why crops are not being grazed more frequently, as well as the pros and cons of grazing crops and stubbles. This led to modelling in our region to better recognise how grazing crops change the risk profile of mixed farms, how they affect the enterprise balance, and which inputs and seasonal conditions are required for grazing crops to be advantageous in low rainfall mixed farming systems. The messages from this modelling will be developed into a resource manual and will be available later in the year on the G&G3 website¹. In addition to being used in the modelling, EP data has also contributed to the development of a stubble assessment tool which provides farmers with a better indication of the quantity and quality of stubbles in their environment.

Four large scale demonstrations were undertaken on commercial crops grazed in winter over the course of EP G&G3, including barley, vetch and oat crops. Biomass, feed quality, grazing pressure, yield and grain quality measurements were carried out on both grazed and ungrazed systems with the information collated with the other G&G project regions, assisting in the development of 'Grazing Cropped Land, 2016 – a summary of the latest information on grazing winter crops from the Grain & Graze program'².

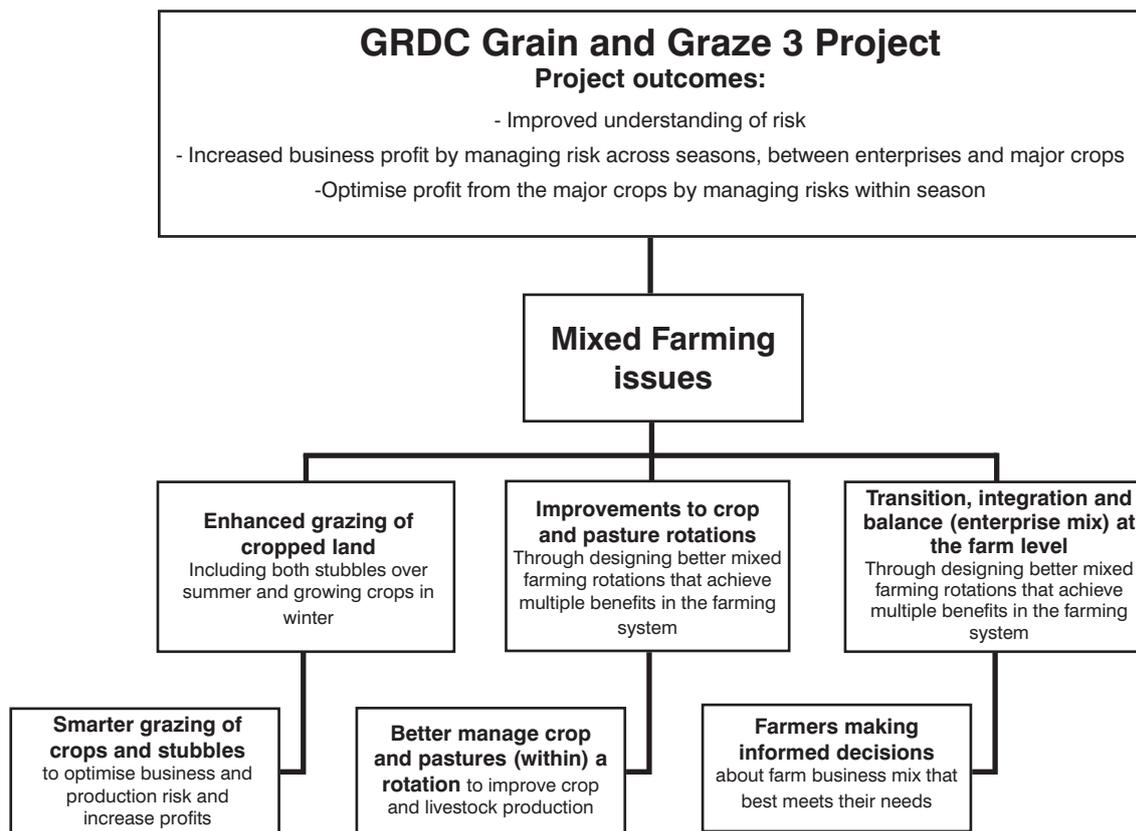


Figure 1 Hierarchy of GRDC Grain and Graze 3 program logic: outcome, issues, and practices

A multi-year trial was undertaken on EP to determine if the grain yield recovery potential after grazing of common wheat and barley varieties differs, apart from the rate in which they develop and mature. Whether nitrogen is able to assist in grazing recovery and yield and/or protein compensation was also investigated. Similar trials, with some variations including reducing or increasing seasonal rainfall, were undertaken in 2015 and 2016 across the other G&G3 regions, with the collective results currently being written up into a scientific paper.

Two other products that will be developed out of the ‘enhanced grazing of cropped land’ practice are a document describing alternatives to owning livestock and a factsheet on the considerations of summer weed control in mixed farming systems from modelled insights, both of which will be accessible through the G&G3 website¹.

Improvements to crop and pasture rotations

Mixed farming systems are inherently complex as there are more choices than for crop or livestock only farms. This complexity is most obvious when decisions around rotations and integration are to be made. Many farmers and advisors are not convinced that integrated complex mixed farming systems provide better returns than cropping and livestock enterprises treated as separate units. They are concerned that it will compromise the cropping system and the additional workload is not sufficiently rewarding. However, rapidly emerging problems such as herbicide resistant weeds and the increasing need for more bagged nitrogen in intensively cropped systems means farmers and advisors are having to find new solutions to these issues. This provides an opportunity to position greater integration of crops and livestock as a possible solution.

EP G&G3 studied the effects of incorporating sheep into a rotation specifically investigating the perception that sheep would negatively affect wheat performance. A long-term trial was undertaken on Minnipa Agricultural Centre (MAC), beginning in 2008 in Grain & Graze 1, where sheep were grazed on medic pastures and wheat stubbles in a wheat-wheat-medic rotation over a nine-year period. The trial found no negative effects on wheat performance or soil organic carbon, while sheep actually improved weed and pest control and nutrient cycling. These results have been reported in the Eyre Peninsula Farming Systems (EPFS) Summaries 2008-2016, as well as other extension methods including the ‘Australian Grain’ national magazine, newspaper articles and presentations at farmer workshops and field days.

Research into components of growing crops and pastures such as crop sequencing, pasture demos, species selection, timing, and sowing rates have been carried out in projects complementary to EP G&G3, with reports generated for the EPFS Summaries and information extended out to sheep groups, field days and other farmer workshops. Other research trials have investigated profitable and productive pasture options in low rainfall areas, including varieties, sowing methods, nitrogen fixation, inoculation, herbicides, regenerating pastures and how grazing affects these factors in mixed farming systems.

Other products from investigations into 'Improvements to crop and pasture rotations' include case studies and testimonials surrounding rotations in mixed farming systems. These have been collated across the G&G3 project regions, including three from Eyre Peninsula, and will be extended out in relevant materials. An Excel-based 'Grain Game' is an interactive virtual farming system exercise which illustrates how decisions made about inputs are impacted by seasonal variability. This game has been delivered at several EP workshops and will be accessible for farmers and advisors through the G&G3 website.

Transition, integration and balance (enterprise mix) at the farm level

Because mixed farming systems are more complex than cropping or livestock operations alone, it requires another layer of thinking: having to integrate the two enterprises effectively and to also consider the risk of not only each enterprise, but also the combination of the two. The G&G program is attempting to quantify how this change in enterprise mix alters the risk profile of the business. The shift to more cropping was partly due

to changes in commodity prices but has also occurred during a period of generational change in farming businesses. Considerable livestock knowledge has been lost and therefore the ability to consider how to introduce livestock (back) into a farming operation and how this would impact on the financial performance and risk is challenging. The progress of farmers shifting from taking a tactical approach to running their business (reacting to issues as they occur) to having a long term strategic plan and business thinking (including the higher level business risk) has also been addressed in the project.

A guide has been developed through the G&G project, *'Farm decision making – the interaction of personality, farm business and risk to make more informed decisions, 2015'*³, that comprehensively covers the topics mentioned above. It has a particular focus on: decision making, people involved in mixed farming systems, farm business basics and risk.

Processes were developed to incorporate succession planning into farm business management, and a document of strategic planning for farming families integrating succession planning and a farm board are both in the final stages of development, and will be available on the G&G3 website upon completion. The @ risk analysis plus other work in adaptive management around volatility, risk and complex decision-making were used to undertake advisor training on EP in 2014 and 2016.

Another product that will be developed out of 'transition, integration and balance (enterprise mix) at the farm level' is a simplified gross margin calculator developed for mixed farming systems that will be accessible on the G&G3 website.

Delivery to growers

From 2014-2016, the EP G&G3 project has been involved with and extended information via 6 field days, 27 articles (technical, scientific and newspaper), 41 workshops, 19 paddock walks, 2 radio interviews and 23 emails. The field days, workshops and paddock walks were attended by approximately 2200 farmers, 880 advisors, 350 researchers and 90 experts from the finance sector over the three years. The articles, radio and email extension methods reached an audience ranging from approximately 400 people in the local EP region to 1200 people throughout the state and over 5000 people nation-wide.

Field days

The EP G&G3 was showcased at the MAC annual field days in September, in addition to some EPARF member field days throughout the duration of the project. An opportunity to present findings from an EP G&G3 research trial also occurred at LambEx in Adelaide during 2014, giving the project exposure to over 900 people in the livestock sector.

Articles

All research results from the EP G&G3 project were published in the annual EPFS Summaries from 2014-2016. Some articles were distributed into other parts of SA, Vic and NSW through the Mallee Sustainable Farming Research Compendium, targeting approximately 1500 people. Local newspapers and the state-wide Stock Journal published six articles from the EP G&G3 project, and four articles were published nationally.

Workshops

From 2014-2016, 20 sheep group workshops were undertaken on EP, supported by EP G&G3, SheepConnect SA, Rural Solutions SA and EPNRM. Topics presented included livestock nutrition, health, genetics, reproduction, feedbase options and assessment, grazing systems, technology, livestock equipment and risk in mixed farming businesses. The workshops were attended by over 220 farmers and 35 advisors over the three years. Each year, growers from 14 agricultural bureaus and groups on upper EP attended meetings, where key messages and research results from the G&G3 project were presented from the previous season. A total of 363 farmers and advisors attended the workshops in March in 2015 and 2016, with the 2016 results yet to be presented at eight workshops in March 2017. Two successful women's agronomy workshops were undertaken with support from G&G3 in 2016 and were attended by approximately 40 people. EP G&G3 hosted a workshop for advisors to explore risk management and communication with farmers, which was held in 2016, attracting 15 advisors, 6 researchers and 4 people from the finance sector.

Paddock walks

Annual 'Sticky beak days' are held in spring on upper EP, where growers visit local properties and discuss trials or issues. The 15-day series of paddock walks were utilised as an extension network by EP G&G3 in 2016 and were attended by approximately 730 farmers and advisors in total. Other paddock walks undertaken on Eyre Peninsula included the women's agronomy group, a grower group field day, MAC open day and student research site visit, which were attended by approximately 150 people.

Other communication

On two occasions, radio interviews were conducted with the ABC radio network on its 'Country Hour' show about the EP G&G3 project, including trials and results over the past three years, with the broadcast extending statewide to a network of approximately 10,000 listeners. Regular emails have been sent to a contact list of around 400 farmers with EP G&G3 updates, information and key messages over the three-year life of the project.

Future RD&E

The Grain and Graze program has been operating from 2003 to 2016 across large sections of the mixed farming zone of Australia with the program starting through a collaboration of the Grains Research and Development Corporation (GRDC), Meat and Livestock Australia, Australian Wool Innovation and Land and Water Australia. The second phase from 2009 to 2013 involved the GRDC in partnership with the federal Department of Agriculture and the final smaller extension phase in G&G3 was funded by GRDC (2014 to 2016). Mixed farming has an essential role to play in the diversification, risk management and sustainability of farming in the future. The high level of complexity in the interactions between cropping and livestock systems highlights the importance of research, development and extension into the mixed farming systems arena.

Resources

¹For more information about the project or for access to G&G publications and tools, please visit www.grainandgraze3.com.au. These books are available on the G&G3 website or through Ground Cover Direct (www.grdc.com.au/bookshop, ground-cover-direct@canprint.com.au or 1800 11 00 44).

²Grazing on Cropped Land – A summary of the latest information on grazing winter crops from the Grain and Graze program (2016), C. Nicholson, A. Frischke and P. Barrett-Lennard, Grain and Graze GRDC project code: SFS000028³.

³Farm Decision Making: The interaction of personality, farm business and risk to make more informed decisions (2015), C. Nicholson, J. Long, D. England, B. Long, Z. Creelman, B. Mudge and D. Cornish, Grain and Graze GRDC project code: SFS000028³.

Acknowledgements

The National G&G3 project committee for support throughout the life of the project, including; Cam Nicholson, Zoe Creelman, Annieka Paridaen, Alison Frischke, Tim McClelland, Jeanette Long, Mick Faulkner, Stefan Schmitt, Jeff Braun, Danielle England and Phil Barrett-Lennard. Mary Crawford, EP Natural Resources, for her support through the National Landcare Program and SheepConnect SA on Eyre Peninsula.



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