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Improving tactical decision making in the western NSW pastoral zone

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Abstract
The Profitable Grazing Systems program: Improving Tactical Decision Making (ITDM) is a group-based training program designed specifically for the New South Wales rangelands. The objective of the program is to assist pastoralists with the adoption of strategic grazing management practices to improve farm business profitability. The program launched in 2021 and has since graduated three groups of pastoralists from Packsaddle, in the state's northwest corner, to Booligal, in the south-eastern rangelands.

Over a 12 to 18 month period, a small group of pastoralists participate in five training sessions. Each session covers a different aspect of rangeland grazing management, culminating in the development of a tactical grazing plan during the final session. At the program's onset, pastoralists are assigned the task of establishing a monitoring paddock, a pivotal tool enabling them to gauge progress towards their management objective. This strategic approach facilitates the self-assessment of the applied grazing strategies' efficacy within their unique landscape, providing guidance for informed decision-making at the program's completion.

Combining their own property knowledge with targeted grazing strategies, pastoralists learn to assess pastures, identify the productive species in their landscape and manipulate grazing management to increase the prevalence of valuable, perennial plants in the feedbase, thereby, improving their ability to condition paddocks to respond to rainfall and withstand dry periods. Complementary skills in livestock production are also covered to build capacity in condition scoring and optimal feed allocation to achieve production goals.

Upon program completion, pastoralists depart equipped with an enhanced ability to monitor, measure, and record pasture and livestock condition, thereby fostering improvements in whole property performance. By merging their existing property knowledge with fresh skills in grazing management, participants are better equipped to navigate the challenges of rangeland management, ultimately paving the way for sustained profitability and resilience within their operations.

Introduction

In the diverse arid and semi-arid rangelands of New South Wales (NSW), effective pasture management is critical for maintaining sustainable and productive grazing businesses. Pastoralists need to manage distinct challenges, including unreliable rainfall, total grazing pressure, variable feedbase composition and growth (Hacker et al. 2019; Hacker and McDonald 2021), leading to the need to make informed, real-time decisions about livestock management and resource allocation.

The Improving Tactical Decision Making (ITDM) program, developed by Western Local Land Services and part of Meat & Livestock Australia's Profitable Grazing Systems (PGS) initiative, is designed to support pastoralists in navigating these challenges by equipping them with practical tools and approaches for strategic grazing management. The group-based coaching model is tailored specifically to the needs of rangeland pastoralists in NSW. By focusing on increasing the capacity of pastoralist's decision making related to grazing periods, key species management, and livestock production, the program aims to enhance whole-property performance and drive greater productivity, sustainability, and profitability for grazing enterprises.

Program Structure

The ITDM program follows tactical management principles (Campbell and Hacker 2000) where participants develop their ability to set an objective, determine strategies to achieve the objective, implement their strategy and monitor accordingly. Five coaching sessions are held on property with a small group of pastoralists for up to 18 months. In preparation for each session, a pasture sample is conducted on four key pasture species at the host property monitoring site. The pasture sample informs feed budgeting activities and discussions relating to plant availability compared to animal selectivity assumptions (Graetz and Wilson 1980; Pahl 2019).

Each session covers different aspects of rangeland grazing management building on from the last, with the final session focused on creating a tactical management plan (Figure 1). The program emphasises practical skills in pasture evaluation, livestock condition scoring, and feed budgeting, all aligned with production objectives. Participants learn to identify key pasture species, recognise quality and quantity trends, and understand crucial rest and recovery phases for landscape health. Grazing management techniques are demonstrated to promote palatable, perennial plants, and participants develop the ability to assess the impact of grazing on plants at different growth stages. Seasonal trigger points (Hacker et al. 2006) are identified for each property and decision plans are created aligned with the livestock production system. Additionally, the program incorporates livestock condition scoring training and remote sensing technology, alongside on-ground measurements, to support decision-making. By the end of the program, pastoralists are equipped to monitor pasture and livestock conditions more effectively, aiming to improve overall property performance and supporting sustained profitability and resilience.

All participating pastoralists complete a baseline survey prior to entering the program and again at completion to assess the knowledge and skills gained from participating. Commencing with the 2023-2024 intakes, pastoralists were also surveyed on their intention to change their business practices as a result of participating. Smaller surveys are conducted at the end of each session to gain feedback on the delivery and inform improvements throughout an intake.

Following each intake, a review of the sessions is undertaken by staff to improve program delivery. Resulting modifications are based on staff experience and direct feedback from pastoralists, aiming to increase pastoralist engagement and knowledge comprehension throughout the program.

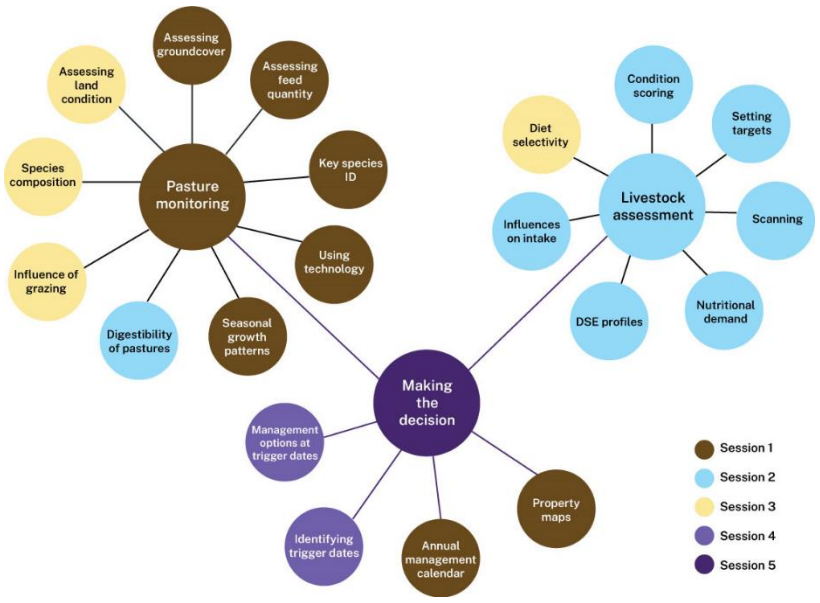

Figure 1. Session breakdown of the ITDM program.

Outcomes

At the time of writing, the ITDM program has been successfully implemented through three groups based in the Oxley (2021), Packsaddle (2023-2024), Ivanhoe and Booligal (2023-2024) areas where the total area managed by participating pastoralists equates to 482,654 ha. In each locality, pastoralists have self-assessed an increased capacity in grazing management and livestock production techniques (Tables 1 and 2).

Table 1. Averaged pre- and post-program self-assessment survey results from three groups of ITDM participants.

On a scale of 1 (low) to 10 (high), how confident are participants in their ability to:	Pre-Program	Post-Program	Change (+/-)
Assess feed digestibility	4.07	7.69	+ 3.62
Estimate feed quantity in kg DM/ha	2.57	7	+ 4.43
Use condition scoring to assess livestock condition	6.36	8.69	+ 2.33
Adjust stocking rate based on feed supply and demand	5.93	8.38	+ 2.45
Manage livestock nutrition to meet production targets	5.57	7.69	+ 2.12
Manage ewes according to their pregnancy status to reduce lamb and ewe mortality	5.64	7.77	+ 2.13
Adjust stock numbers guided by your grazing strategy and monitoring	6.14	8.62	+ 2.48

Table 2. Averaged pre- and post-program self-assessment survey results from the Oxley (pilot program) and the Packsaddle (P), Ivanhoe (I) and Booligal (B) (2023-2024 groups) participants of ITDM.

On a scale of 1 (low) to 10 (high), how confident are participants in their ability to:	Pre-Program - Oxley	Post-Program - Oxley	Change (+/-) - Oxley	Pre-Program – P, I, B	Post-Program– P, I, B	Change (+/-)– P, I, B
Assess feed digestibility	4.75	6.75	+ 2.00	3.80	8.11	+ 4.31
Estimate feed quantity in kg DM/ha	3.00	5.25	+ 2.25	2.40	7.78	+ 5.38
Use condition scoring to assess livestock condition	7.50	8.25	+ 0.75	5.90	8.89	+ 2.99
Adjust stocking rate based on feed supply and demand	7.25	8.00	+ 0.75	5.40	8.56	+ 3.16
Manage livestock nutrition to meet production targets	5.50	7.50	+ 2.00	5.60	7.78	+ 2.18
Manage ewes according to their pregnancy status to reduce lamb and ewe mortality	7.50	7.50	0.00	4.90	7.89	+ 2.99
Adjust stock numbers guided by your grazing strategy and monitoring	7.50	8.50	+ 1.00	5.60	8.67	+ 3.07

All participants (10) from the 2023-2024 intakes indicated they plan to make changes to how they manage their business as a result of participating in the program, and fifty percent (5) had already made changes before program completion. Pastoralists in the first (pilot) intake of the program were not surveyed on practice change.

Learnings

Improving Tactical Decision Making was first delivered as a pilot program in 2021. This initial intake of pastoralists had a reasonably high self-assessed confidence in livestock production related skills (7.25 - 7.50) prior to their participation in the program. When reassessed at the conclusion of ITDM, a small increase (0.00 - +1.00) in confidence was seen across these skills compared to feedbase related skills (+2.00 - +2.25). In contrast with the two 2023-2024 groups, whose livestock-based skills were rated lower overall (4.90 - 5.90) and saw a larger increase in confidence (+2.18 - +3.16), finishing the program at a similar level of confidence to the pilot participants. Interestingly, all intakes shared a low confidence in their ability to assess feed digestibility and estimate feed quantity in kg DM/ha prior to the program, with the largest increase in confidence post-program seen in the more recent intakes (+4.31 - +5.38).

Following the delivery of the pilot program, modifications were made based on experience and feedback from the initial delivery. Predominant changes included refining session plans and presentations, redesigning feed budgeting templates and the creation of supporting material. Additional interactive field activities were also developed for the final session to encourage pastoralists to utilise skills obtained earlier in the program and present findings to the group. Following the delivery of the 2023-2024 Packsaddle, Ivanhoe and Booligal groups, each session will be reviewed, and updates made before delivery to future intakes of the program. Adjustments are informed by the level of expertise in the incoming groups but also the lessons learned from the past groups.

It is difficult to discern whether the preliminary modifications of the program led to the larger increase in confidence level between the pilot and recent program intakes or pastoralists with lower initial confidence gained more from the program. The pilot program was conducted directly after an extended drought when pastoralist focus was likely directed towards more intensive livestock management due to ration feeding programs.

Additionally, service provider support is known to increase in dry periods, likely contributing to an increase in capacity before participation. In contrast, the most recent intakes were initiated during a high rainfall period. Moreover, the geographic spread of participants could lead to discrepancies in opening confidence levels due to differences in production systems, climate and landscape challenges. Furthermore, additional differences in the implementation of the content have occurred at each intake due to changes in personnel delivering the program.

The commitment to practice change demonstrated by the survey results of the ITDM program suggests that when pastoralists are coached through the tools and knowledge to tactically manage their pastures, significant capacity building improvements can be observed. Therefore, the integration of monitoring tools, such as condition scoring, feed budgeting, and remote sensing technology, with increased understanding of grazing management principles enables pastoralists to be more confident in making informed, tactical decisions that align with environmental conditions. Although the program successfully built participants' capacity to make data-driven decisions, long-term monitoring and ongoing support are essential to ensure that these new practices are maintained and refined over time. Furthermore, while the integration of remote sensing technology has been beneficial, it requires pastoralists to have adequate technological ability and appropriate training to operate independently, which may present challenges for some participants beyond the program.

Conclusion

The Improving Tactical Decision Making program has proven to be an effective tool for enhancing grazing management and resource allocation confidence in three groups of pastoralists in the NSW rangelands. As climate variability continues to impact the productivity of rangelands, adaptive management strategies like those taught in the ITDM program will be increasingly important for the long-term viability of arid and semi-arid grazing systems. The success of this program to date highlights the value of providing pastoralists with the knowledge, skills, and tools necessary to make informed decisions and adapt to changing conditions. Through continued support and innovation, the program has the potential to make a significant contribution to sustainable grazing management in the western NSW pastoral zone.

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References

Campbell T, Hacker R (2000) ‘The Glove Box Guide to Tactical Grazing Management for the Semi-Arid Woodlands’, (NSW Agriculture: Dubbo).

Graetz RD, Wilson AD (1980) Comparison of the diets of sheep and cattle grazing a semi-arid Chenopod shrubland. *The Australian Rangeland Journal* 2(1), 67-75.

Hacker RB, Alemseged Y, Carberry PM, Browne RH, Smith WJ (2006) ‘Betting on Rain, Managing Seasonal Risk in Western NSW’, (NSW Department of Primary Industries: Dubbo).

Hacker RB, McDonald SE (2021) Prospects for sustainable use of the pastoral areas of Australia’s southern rangelands: a synthesis. *The Rangeland Journal* 43, 185-209.

Hacker RB, Sinclair K, Pahl, L (2019) Prospects for ecologically and socially sustainable management of total grazing pressure in the southern rangelands of Australia. *The Rangeland Journal* 41, 581-586.

Pahl L (2019) Macropods, feral goats, sheep and cattle. 2. Equivalency in what and where they eat. *The Rangeland Journal* 41, 519-533.