

## Harnessing producers' tropical grass experience to support potential new producers

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**Abstract:** *Climate projections together with farm systems modelling for southern Australia suggest conditions will reduce the length of the growing season of temperate species. This will result in an extended summer-autumn feed gap. Tropical species are a potential option to fill this gap. Research has commenced to identify the key enablers and constraints to trialling and 'successful' management of tropical grass based pastures. The approach is to conduct a series of workshops, initially with producers who have experience establishing and managing tropical grass pastures followed by a broader survey of experienced and inexperienced producers, and then semi-structured interviews with selected producers. This paper summarises the key findings from the first producer workshop held at Purllewaugh, NSW. Producers identified three critical success factors in establishing and managing tropical grasses: implementing a two to three year pre-sowing weed control program to reduce the summer grass seed bank; at sowing, ensuring that seed is sown shallow; and maintaining soil fertility with strategic applications of phosphorus, sulphur and nitrogen. Producers stressed the importance of service providers and producer networks in supporting them in their efforts to trial and manage tropical grasses. The experiential producer knowledge gathered in this research component will contribute to an extension package to support producers with an interest in trialling tropical grasses in the more southern areas of Australia.*

**Key words:** weeds, germination, fertiliser, practice, extension

### Introduction

Across the slopes and plains of northern NSW tropical perennial grasses have been found to be highly productive, responsive to summer rainfall and nitrogen, and are able to rapidly recover after dry conditions. These grasses have become an important component of grazing systems in this geographic zone, largely replacing sown temperate grass pastures (Harris *et al.* 2014; Boschma *et al.* 2015, 2017; Murphy *et al.* 2019).

Australia's climate has warmed 1°C since 1910 with average temperatures in south-eastern Australia projected to increase further (CSIRO and BoM 2015, 2018). Furthermore, the rainfall in this region is projected to decline and the distribution to shift to a summer dominant pattern (CSIRO and BoM 2015, 2018). Farming systems modelling has demonstrated that under these projected climate conditions the growing season for temperate forage species will be reduced and, as a consequence, the summer-

autumn feed gap will be extended (Cullen *et al.* 2009; Moore and Ghahramani 2013). Under this scenario, integrating productive tropical species into the feedbase of southern Australian farming systems has the potential to reduce the risk of this projected feed gap.

A multi-disciplinary research program, "Increasing livestock production by integrating tropical pastures into farming systems" commenced in 2018. This program has been designed to increase the productivity of red meat production in southern Australia under a changing climate by introducing tropical pastures. The aim of one research component is to identify the key enablers and constraints to trialling and 'successful' management of tropical grass based pastures. The information will be used to inform the development of an extension package to support those producers in southern Australia intending to include tropical grass pastures in their feedbase.

In this component we are drawing upon the prior experience of those producers in northern and central NSW who have successfully

established and managed tropical grass based pastures. We are also testing the proposition with those producers in central and southern NSW that to date have not trialled or may have trialled a small area of tropical grasses. We are also capturing the knowledge of key service providers and NSW Department of Primary Industries researchers.

The research approach is to use a mix of qualitative and quantitative methods. It is proposed to conduct a series of five workshops with producers and some selected key informants (qualitative), a broader survey of both experienced and inexperienced producers (quantitative) and semi-structured interviews with selected producers (qualitative).

This paper describes the workshop approach and presents some findings from a recent workshop held at Purlawaugh in northern NSW. The participants in this workshop were producers with experience in successfully establishing and managing tropical pastures.

### Workshop approach

Eleven producers were purposefully selected to participate in the workshop to obtain a diversity of experiences. Within the group, producers ran different enterprises on properties across different soil types and climatic conditions from Boggabri in the north, to Gilgandra and Coolah in the south. They also had different years of experience in establishing and managing tropical grasses. The producers were divided into two groups to provide a small group setting with near neighbours allocated to a different group. This provided the opportunity for each producer to describe their experiences, allowed time for clarification and discussion, and maximised data collection.

Within each group, producers were asked a series of key questions to draw out their knowledge and experience with tropical grass pastures. These questions included their first experience establishing tropical pastures, and their current establishment practice and grazing management. Producers also described the benefits and challenges with establishing and managing tropical grasses. Additionally, each

producer listed the three most important practical lessons they would pass on to producers considering including tropical grasses in their farming system.

### Key findings

Although these producers had trialled and successfully managed tropical grasses, there was considerable diversity in their experience with establishment and management of these grasses on their property. Producer enterprises included growing out steers for feedlots, exporting live steers, breeders and traders, Merino sheep for wool and prime lambs.

Producers recognised the economic value of tropical grass pastures to their farm business in providing a long-term and low-cost feed base of high quality. They had been able to achieve a 'big' lift in productivity as a result of an increase in carrying capacity and/or improved wool quality. Other benefits identified included:

- Ability to control difficult weeds including spiny burr grass (*Cenchrus incertus*) and blue heliotrope (*Heliotropium amplexicaule*);
- Ability to persist, 'Sown once and you don't have to worry about it again' (producer);
- Drought tolerance, 'A resilient pasture that can bounce back after drought' (producer);
- Highly responsive to late spring, summer and early/mid-autumn rainfall events;
- Ability to provide erosion control; and
- Ability to improve soil health with their ability to root at depth.

Producers also recognised there were constraints, most notably, the high cost in establishing the pasture and issues relating to the commercial nature of seed supply. The main constraints identified included limited or inconsistent availability of seed, low germination and purity of seed, and the cost of coated seed.

Producers believed the pre-sowing 'clean-up' phase was critical to reduce the weed seed bank, especially of summer grass weeds. 'Impeccable weed control over three to four years prior to attempting establishment' (producer) is

essential to reduce the potential for grass weeds to emerge during establishment. Other critical establishment factors identified included:

- Matching species/cultivar to soil type;
- Checking germination and purity of the seed, *'Testing germination is important on all seed produced or bought'* (producer);
- Sowing in spring ahead of rain if subsoil moisture is available and ground temperature is between 16–18°C;
- Ensuring seed is sown shallow, *'Fine when [seed is] dropped on ground and press wheel following'* (producer);
- Soil test and correct for phosphorus, sulphur and nitrogen deficiency; and
- Be patient, especially in difficult years, *'Don't be concerned how establishment...looks for the first 12–24 months...often takes a few years to thicken up'* (producer).

To maintain a productive high quality pasture, producers believed it was important to keep the pasture 'short and green' by using a high stocking rate where possible. Key grazing management factors include:

- Duration: *'Eat a third, trample a third, leave a third'* (producer);
- Intensity: *'Don't overstock or overgraze'* (producer); and
- Interval: *'Many grasses are most valuable before getting long and rank'* (producer).

Other critical pasture management factors identified included:

- Allowing to flower and set seed prior to first grazing for persistence;
- Time to first grazing is highly variable, *'Could be three months or seven months depends on when the rain falls'* (producer);
- Managing excessive pasture growth by leaving as a standing haystack or slashing; and
- Applying phosphorus and sulphur in autumn and nitrogen in spring if required, *'The more*

*you feed your grasses, the better they will feed your stock. That is, healthier grasses have far higher nutritional value'* (producer);

Producers identified what they believed were the three most important practices that new producers should implement to achieve 'success'. These practices were to establish a weed-free seedbed, sow seed shallow, and maintain soil fertility.

Extension support was viewed by producers as crucial to their trialling and subsequent successful adoption of tropical grasses into their feedbase. Many producers emphasised the role of networks and respected individuals to support their efforts in trialling tropical grasses. As one producer explained *'Last 20 years swapping ideas with George A and agency staff. Importance of field days. Bob F was a huge influence. Networking. Getting together sharing information [about] what works and what doesn't work'*.

## Conclusion

This workshop revealed how these selected producers have trialled, successfully managed and integrated tropical grasses into their feedbase. It also revealed that their initial testing was conducted within a framework which provided quality information and strong social networks, with respected producers promoting the agronomic and productivity benefits of these pastures. Even though establishment costs are high and the establishment phase can be prolonged, once the producer participants realised the economic gain that could be achieved they willingly expanded the area they had initially sown to tropical grasses. The experiential producer knowledge gathered in this research component will contribute to an information framework to support producers (and their service providers) with an interest in trialling grasses in the more southern areas of Australia.

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