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A survey of farmer practice on the establishment, duration and production of pastures in the mixed farming zone of southern New South Wales

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Abstract

This paper reports the results from a survey conducted in the mixed farming zone of southern NSW to determine the method and success of pasture establishment, farmer perceptions on pasture production, timing and methods for ending the pasture phase, as well as livestock production and feed base sources throughout the year. The survey was conducted at 7 farmer forums organised by various farming systems groups and district agronomists. A total of 114 responses were received. Averaged over the whole region, 48% of growers established pastures by under-sowing in greater than 75% of occasions while 32% of growers never used the under-sowing technique. Cover-crops used for under-sowing were primarily wheat (56%) and barley (30%). Pasture mixes primarily included lucerne (72%) with phalaris the second most common perennial (33%). In an average rainfall year, 60% of farmers rated their pastures as excellent or satisfactory, while 62% of farmers rated their pastures as satisfactory or poor over the ten drought years from 2000-2009. During average years, 70% of farmers had a pasture phase for 4-6 years but during the drought years, only 47% of pasture phases ran for 4-6 years while 30% of pasture rotations were 4 years or less. Poor persistence was ranked by 75% of producers as one of the top three reasons for ending the pasture phase. The average stocking rates were 6 DSE/ha and 11 DSE/ha based on total farm area and total pasture area respectively. Feed for adult stock over a calendar year was primarily pasture based (57%) with stubble as a significant contributor (18%). In contrast, feed for young stock was 65% pasture based and only 7% reliance on stubble, but 14% on grazing crops.

Key Words

Mixed farming system, cover cropping, grazing, livestock.

Introduction

Pastures in the cropping zone have played an essential role in nitrogen budgets for crops, meat and wool production and diversification of farm enterprise. Typically, mixed farms in southern NSW operate a phase farming system with 4-6 years of pasture in rotation with 4-6 years of cropping (Kirkegaard *et al.* 2011). Surprisingly, there is little quantitative information to describe what a mixed farm looks like, what influences the decision making process, or how and when farming operations are conducted. A previous study conducted by Li *et al.* (2010) reported that on average, 52% of the land on mixed farms in southern NSW was under cropping, 29% was in perennial pastures and 19% in annual pastures. The current survey described here sought to determine: (i) how and what pastures were established, (ii) how farmers perceive the productivity of their pastures, (iii) what critical factors initiated the change from pasture to crop, (iv) what was the stocking rate of these pastures and (v) what was the major source of feed used on farm.

Methods

The survey targeted a range of mixed farms across southern NSW with rainfall ranging from 400-750 mm. The survey was conducted at 7 farmer

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pasture legumes.

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A survey of farmer practice on the establishment, duration and production of pastures in the mixed farming zone of southern New South Wales

forums organised by various farming systems groups and district agronomists. A total of 114 responses were received. The farmers were given a standard questionnaire to complete during the meeting. The name and property of the farm was not recorded, but geographic location and rainfall was to enable differences across the region to be extracted. This paper reports the results based on the entire area. There were four different sections to the questionnaire. Firstly the geographic location, rainfall and the various proportions of the farm into cropping and pasture. Secondly, how pastures were established and particularly focussed on under-sowing, machinery and pasture species and rates. Thirdly, farmer perception of pasture productivity, factors determining the end to a pasture phase and how the pasture phase was ended. Finally, establishing the number and type of livestock on farm and what the sources of feed were used throughout the year.

Results

Pasture establishment

Some 48% of growers used under-sowing as their main method of pasture establishment (i.e. >75% of the time), while 31% of growers reported that they never used this approach. Seventy-six percent of growers sow pasture in the middle or end of sowing operations. Only 9% sowed pasture early in the sowing operation with 14% sowing in spring. Under-sowing was believed to be a successful means of establishing a pasture greater than 60% of the time in an average rainfall year by 85% of growers, but only 34% of growers reported that this technique was successful during the 2000 to 2009 years of drought. The perception of success rate changed depending on conditions (Figure 1). In an average year, most farmers determine under-sowing to be satisfactory if the success rate was above 80%. Under-sowing was deemed as satisfactory if the success rate was greater than 50% success rate during drought. The wide range of responses demonstrated the diversity of views on what constituted a satisfactory pasture establishment.

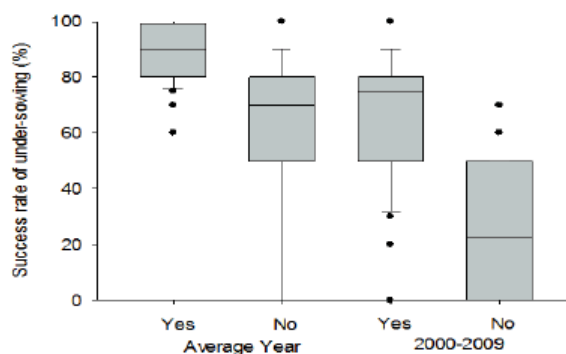


Figure 1. Farmer perception of whether under-sowing establishment is satisfactory or not and how it is related to their perceived success rate of under-sowing. Box plots for all data response with boxes to 25-75% of data, median line within the box, whiskers out to 5 and 95% percentiles and stars marking outliers.

Pasture mixes

Lucerne was the primary pasture species with 72% of respondents using it in their pasture mix while phalaris was used in 33% of pasture mixes. Chicory, perennial ryegrass and cocksfoot were used 17, 12 and 7% in pasture mixes, respectively. Forty eight percent listed "clover" as a component of their pasture mix, but did not specify species. Subterranean clover was used by 40% of respondents, but the reported usage of other annual legumes was at very low levels.

Pasture production and persistence

In an average rainfall year, 60% of farmers rated their pastures as excellent or satisfactory, while 62% of farmers rated their pastures as satisfactory or poor over the drought years of 2000 to 2009. On average, 70% of farmers retained a pasture phase for 4-6 years. Drier conditions during 2000 to 2009 changed that to 47%, with 30% of farmers having a pasture phase of less than 4 years. Poor persistence was ranked by 75% of producers as one of the top three reasons for ending the pasture phase. Poor pasture establishment (69%) and annual grass weeds (67%) were rated as the other main reasons for ending the pasture phase. Twenty six percent of producers

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rated change in commodity prices as one of the top three reasons for ending the pasture phase.

Moving into the cropping phase

Removal of pastures for the cropping phase mainly occurred in September and October (70%). To create a fallow at the end of the pasture phase 95% of responses used herbicides, 21% used tillage sometimes, while 5% listed tillage as their only method. The first crop after the pasture phase was split primarily between canola (45%) and wheat (43%) with oats and lupins as other options.

Stocking rates and feed base

The average stocking rates were 6 DSE/ha and 11 DSE/ha based on total farm area and total pasture area respectively. Feed for adult stock over a calendar year was primarily pasture-based (57%) with stubble as a significant contributor (18%). On a month by month basis, feed source for adult stock in January was primarily stubble (62%) with 32% pasture (Figure 2). In the autumn months, pasture was the main source of feed (50%) with a high proportion of hay or silage used (29%). In the winter months, the use of grazing crops equalled the use of pasture. In contrast, feed for young stock was 65% pasture-based and only 7% reliance on stubble, and 14% on grazing crops. On a month to month basis, the reliance on stubble in January was only 23% with pasture accounting for 68% of feed supply for young stock. The use of grazing crops in winter was higher for young stock compared to adult stock (41% c.f. 32%).

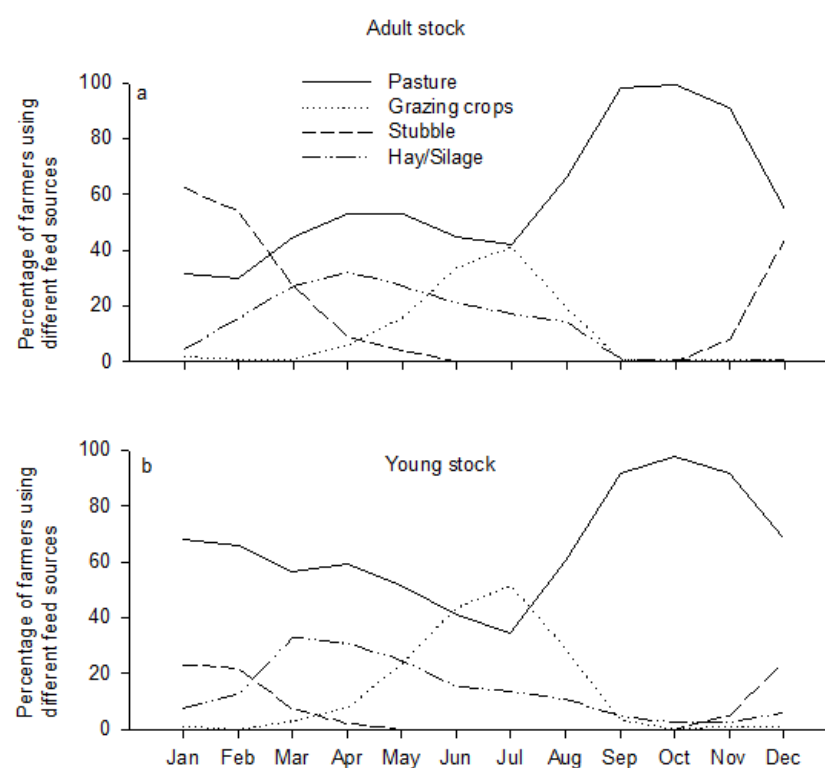


Figure 2. The percentage of farmers utilising a particular feed source for each month of the year for a) adult stock and b) young stock.

Discussion

The establishment and persistence of pastures continues to be an issue for mixed farms (Peoples *et al.* 2010). The use of under-sowing continues to be widespread practice to establish pastures despite reduced pasture production and increased risk of failure (Cregan 1985; Dear 1986; Peoples *et al.* 2010). The sowing of pastures tend to be a lower priority than cropping with pasture sowing occurring later in the sowing operations. Farmers generally consider that they have excellent or satisfactory pastures, but there are obvious differences in perceived success of pasture establishment techniques. Interestingly, farmers were satisfied with their pastures, but pasture persistence was the main reason many gave for moving back into the cropping phase. Unlike crops where production is easily benchmarked (e.g. French and Schultz 1984), there does not seem to be the same emphasis on benchmarking of pastures. In fact there is little data for the cropping zone to determine what an optimal lucerne stand is with advisors generally using self developed "rules of thumb". With this in mind, it is not hard to understand why farmers may have very different perceptions of what successful pastures really are.

Pasture mixes were dominated by lucerne with phalaris being included in higher rainfall areas (data not shown). Interestingly farmers commonly did

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not identify the species or cultivars of clovers that were sown and often used the generic term "clover". A very low number of farmers used alternative annual legume species other than subterranean clover, with arrowleaf clover being the highest at 7%. The common use of the generic term "clover" could contribute to an underestimation of the use of species other than subterranean clover but anecdotal evidence would indicate most meant subterranean clover. Presumably alternative annual legume species are yet to clearly demonstrate their benefits to the mixed farming system.

Livestock enterprises predominantly utilised pastures with stubbles as an essential feed source over the summer period as expected. The use of grazing crops has become widespread and were mainly utilised in the winter period during periods of low pasture growth. Hay and silage continue fill the autumn feed gap.

Conclusion

Within the mixed farming zone of southern NSW, pastures continue to be an important component although it appears that establishing pastures has a lower priority than cropping operations. Farmers were generally satisfied with pasture production, but primarily moved back into the cropping phase due to poor persistence presumably manifesting itself in low productivity. There is little benchmarking of pastures undertaken in the mixed farming zone and it is possible that farmer perception may not match reality. Lucerne continues to dominate pasture mixes and it appears that alternative annual legume species have not become widely adopted. Pasture was the predominant feed source for livestock however stubble, grazing crops and hay and silage were essential to complete the year round feed budget.

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