

# 09

## FarmLink Research Report 2016

### What do pastures look like in the mixed farming zone?

#### Project Partners



#### Funding Partners



**Trial Site Location** FarmLink region

#### Report Author

Dr Jeff McCormick

#### Introduction

A pasture survey was conducted with 17 FarmLink members and comprised of 54 paddocks in total. The purpose of the survey was to determine how pastures were managed on farm and what pasture species were sown on mixed farms. An assessment of the paddock then compared the sown species to what was growing in the paddock. In total across the farms, 15 different species were sown, but lucerne and subterranean clover were the dominant species being sown in 80% of paddocks. The average frequency in which these species were found was greater than 60% but with large variation between paddocks. Sown species produced 62% of dry matter on average across all paddocks. It was determined that unless the frequency of a species in the paddock was at least 50% then the contribution to production of that species would be low (<20%). Using the frequency benchmark of 50% it could be demonstrated that pasture composition commonly includes only 2-3 of the sown species.

## What was done?

Seventeen farms were visited with 54 paddocks surveyed in late spring in 2016. Interviews were conducted on each farm to determine for each paddock the species that were sown and agronomic management of the pasture. This included method of pasture establishment (straight sown vs undersown), weed management (winter cleaning/spray topping), fertiliser use and grazing management. The pasture paddocks were surveyed by walking diagonal transects across the paddock with pasture assessments occurring in 50 sampling positions that were approximately evenly spaced. At a sampling position approximately 0.25 m<sup>2</sup> of pasture was assessed by two methods. Firstly, the frequency of the sown species was determined. This assessment simply indicated whether the sown species is present or not. Secondly, the species with the highest estimated dry matter were ranked to determine pasture composition using the dry weight rank technique.

## What do our pastures look like?

Preliminary results showed that average paddock size was 38 ha with a range of 14-112 ha. Seventy one percent of paddocks were established via undersowing with the rest established either by straight sowing of autumn pasture or summer sowing hard seeded legumes. Eighty nine percent of paddocks had had some weed control by winter cleaning or spray topping during the pasture phase and top dressing with super phosphate was undertaken on 46% of paddocks. Grazing management was predominantly set stocked (83% of paddocks) from winter to harvest time.

Fifteen different species were included in pasture mixes on farm. Lucerne and subterranean clover were sown in more than 80% of paddocks. The next most common species were arrowleaf clover and medic. The number of species sown in a pasture mix ranged from one to six different species and commonly multiple cultivars of subterranean clover were included.

Species	No. of paddocks sown	Percentage paddocks sown	Frequency		Dry matter composition	
			Average	Range	Average	Range
Lucerne	47	87%	65%	0-100%	27%	0-73%
Sub clover	44	81%	64%	0-100%	20%	0-74%
Arrowleaf clover	19	35%	40%	0-94%	11%	0-44%
Medic	17	31%	15%	0-78%	3%	0-34%
Balansa clover	10	19%	82%	50-100%	30%	1-79%
Cocksfoot	9	17%	45%	0-96%	10%	0-30%
Bladder clover	8	15%	44%	0-90%	5%	0-21%
Phalaris	6	11%	44%	0-88%	18%	0-43%
Gland clover	5	9%	89%	78-96%	21%	5-35%
Biserulla	4	7%	50%	2-94%	36%	0-73%
Chicory	2	4%	12%	0-24%	2%	0-5%
Fescue	2	4%	85%	72-98%	26%	13-39%
Rose clover	2	4%	79%	70-88%	29%	6-51%
White clover	1	2%	0%	na	na	na

Table 1



The average frequency with which lucerne and subterranean clover was found in the pastures was 65% and 64% respectively although the range of frequency was from 0-100% for both species. Other species that were commonly sown including arrowleaf clover, medic and balansa clover on average had frequencies of 40%, 15% and 82% respectively, but they also had very wide ranges. Other species that had high frequencies included gland clover and tall fescue although these were taken from a much smaller number of paddocks and may not represent their average performance. On average, lucerne and subterranean clover provided 29% and 24% of the dry matter respectively with ranges from 0-74%. For other less commonly sown pastures the averages are less helpful but it can be seen other species can be highly productive under certain conditions but they could also sometimes produce very little feed. Across all paddocks sown species were shown to contribute 62% of the dry matter but this ranged from 11-89%. If the species are broken down into functional groups then perennial legume (lucerne) provided on average 29%, annual legumes 39% and perennial grasses 26% in the paddocks in which they were sown. It should be noted that included in annual legumes group was clustered clover which was very prominent in some pastures in 2016. Annual grasses formed the largest weed component of 31% while broadleaf weeds tended to be less with 5%.

## What does this all mean for pasture establishment and management?

If we compared the frequency of an individual species with the contribution that it makes to dry matter for the same paddock there is a wide range of dry matter levels produced (Figure 1). It indicated that species can have a high frequency but contribute very little to production. But Figure 1 also indicated that if the frequency of a species is less than 50% there is no potential for it to make a meaningful contribution to pasture production (approx. 20%). Frequency can be very easily determined on farm by walking across the paddock and stopping multiple times. Assess the species located immediately around your feet (0.25m<sup>2</sup>) and if the species is present in less than every second stop then it is unlikely to be providing significant feed.

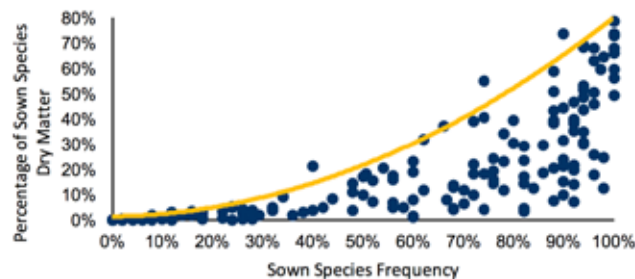


Figure 1. The effect of species frequency on dry matter production. Line plotted by eye to demonstrate upper limits of production.

In terms of the number of species sown compared to what was found in the paddock there was a small decrease in the number of species (Figure 2). If we only considered those species that had a frequency higher than 50% then the number of useful species in the pasture decreased greatly compared to the number of species sown. Figure 3 demonstrated that pastures commonly only have 2-3 species sown species that contribute significantly to pasture production. All species in the list (Table 1) can be productive in this environment (except White clover) but specific species should be sown for a purpose and managed appropriately. Only a few species will be productive out of "shotgun mixes" and reducing the number of species sown may enhance the productivity of the species that are sown.

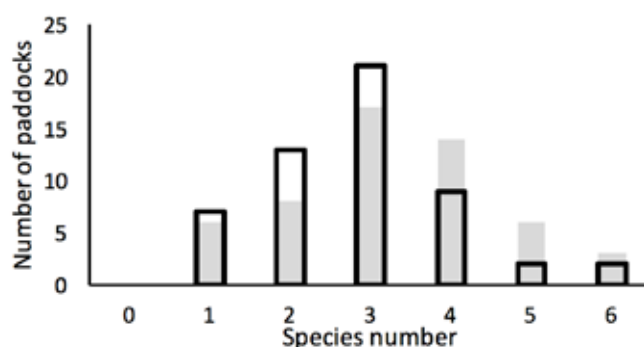


Figure 2. Comparison of number of sown species (grey bars) compared to the number of sown species found in the paddock (open bars).

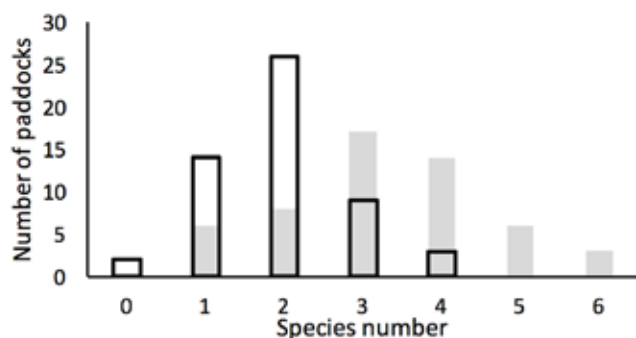


Figure 3. Comparison of number of sown species (grey bars) compared to the number of sown species with greater than 50% frequency found in the paddock (open bars).

Lucerne rightly continues to be an important species in the mixed farming zone. Interestingly only 3 out of the 17 farmers had any type of rotational grazing management system. Most pastures were set stocked for long periods of the year despite decades of research demonstrating that lucerne persistence decreases dramatically

under set stocking. Many conversations indicated a resistance to rotational grazing plus the spread of pasture paddocks across farms make rotational grazing very difficult. If lucerne is to be productive and persistent then significant rest periods need to be enforced on farm.

## Conclusion

On average sown species provided the majority of feed available (>62%) within a paddock but there was very large variation from paddock to paddock. Most species used in the pasture mixes can be productive but mixes need not contain more than three different species. Pasture species need to have greater than 50% frequency to be a productive component of the pasture. Each species in the mix needs to be included for a purpose and managed accordingly rather than a "shotgun" approach hoping that one species will work. Grazing management of lucerne needs to consider periods of rest to ensure productivity and persistence.