

A survey of perennial pasture establishment practices in southern NSW

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Abstract

The establishment of perennial pastures is an expensive process variably estimated to cost between \$250-400 /ha. In the higher rainfall zone of southern NSW, 61 paddocks were surveyed in the spring of 2005 to determine the relationship between establishment practices and persistence of the sown species. Thirty-four farms were selected and 1-2 paddocks were surveyed on each farm. Key paddock management factors such as year of establishment, species sown, establishment techniques, fertiliser and grazing practices were obtained from the farmer. Botanical composition and frequency of sown species were recorded for each paddock. The results indicate that the number of species sown varies widely (between 2 and 8) but this has little impact on overall persistence. The two most persistent species were sub clover and phalaris and these were also the most commonly sown species. Other species occurred in less than half the paddocks that they had originally been sown in. The implications of these results are that many farm advisers recommend species that are not able to persist and, as a result, farmers are burdened with higher establishment costs than are necessary.

Key Words

Pasture establishment, higher rainfall zone, species mixes, survey

Introduction

In the higher rainfall zone of southern NSW, pasture establishment is a major cost for producers. Hence, when sowing a pasture, persistence should be a key aim and management geared to ensure maximise this. Pastures are usually based on a range of perennial grasses with annual and/or perennial legumes. Increasingly there has been a trend to sow diverse pasture mixes that might include up to 4 perennial grass species and 2-3 legume species. Unfortunately, there is little data to support the strategy of sowing diverse mixtures. On the one hand, the practice appears sensible in that it maximises the opportunities for species to be placed in appropriate niches within the paddock. On the other, if most of the species don't survive, then the practice represents an unnecessary cost to the producer. Worse still, there is the possibility that if some species do not persist, then those that do may do so at sub-optimal densities.

A survey of 61 paddocks was carried out in spring 2006 to examine the practice of sowing diverse pasture mixes. Farmers were asked a set of routine questions regarding their establishment practices and these were matched with a botanical analysis of what was found in the resulting pasture.

Methods

Landholders who lived within the target area (> 550 mm annual average rainfall, south west slopes, NSW) were randomly selected from t lists of stock sales in local papers and were approached to cooperate with the survey, few declined. One pre-requisite of involvement in the survey was that the landholder had to have reliable records of pasture establishment. Over the 34 farms surveyed, 61 paddocks were selected. Selection was unbiased in that landholders were asked to nominate paddocks that they had sown to improved pastures in either the last 1-5 years or 5-15 years (range surveyed 2 – 28 years). Most could

only nominate 1 or 2 in either category. Having nominated potential paddocks for the survey, the landholder was then interviewed regarding establishment and management practices of the paddock. The establishment factors considered covered all aspects of pastures establishment (number and identity of species sown, sowing rates, sowing method, pre-establishment management, fertiliser, year etc.) as well as post establishment management (grazing, fertiliser, herbicide, insecticide etc.).

In each paddock, quadrats were placed at one hundred sample points located along two perpendicular transects. One transect was located to cover the maximum range of landscape variation in the paddock, the other was placed perpendicular to the first approximately halfway through the paddock. Along each of the transects, 50 equally-spaced quadrats were assessed for botanical composition using the dry-weight rank method (Mannetje and Haydock 1963), feed on offer (visual score) and for the presence of sown species. In addition, soil samples were taken at 16 of the sample points and bulked for chemical analyses (pH, phosphorus). Care was taken to avoid unsown areas within the paddocks (rocky outcrops, under trees etc.) as these would bias the results.

Results

The median number of species sown was five, whereas the median number found (at all, i.e. above a frequency of 0%) in the paddock was three. While five species were sown in 20 out of 61 paddocks, all five species could only be found in only four of the paddocks. However, to meaningfully contribute to pasture production, species must be present at a higher level of frequency. A level of 30% has been chosen, as it represents the lower limit at which botanical composition *may* increase above 5% (Virgona, unpublished). The median number of sown species that occurred at frequencies > 30% was two (Fig 1). If, on the other hand, a benchmark of 5% feed on offer is set based on the spring 2005 results, then the median number of sown species that exceeded this level was only one (data not shown). The two most persistent species found were phalaris and subterranean clover. Further analysis revealed that three factors were related to the contribution of phalaris as a proportion of fed on offer: soil phosphate (positively), paddock size (negatively), and the amount of phalaris sown as a proportion (by weight) of total perennial grasses in the seed mix (positively). In other words, when other perennial grasses that did not persist were sown, the outcome was worse for the most persistent species, phalaris.

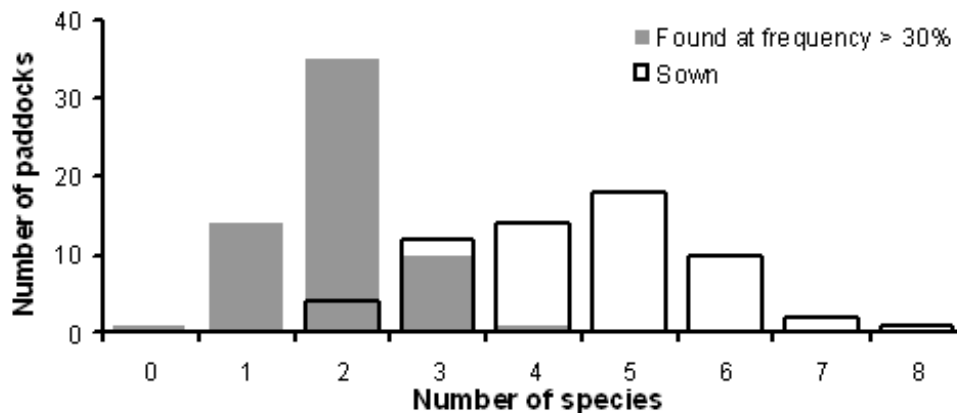


Figure 1. Frequency distribution of paddocks for the number of species sown (open) and the number found at a frequency of > 30% (shaded).

Conclusion

When sowing permanent perennial pastures, diverse pasture mixes have not been successful as only 2 species are usually found at a meaningful level. In choosing species to be included in pastures, farmers, agronomists and consultants must base their decisions on evidence of long-term persistence. Otherwise

the practice of sowing diverse mixtures represents an unnecessary upfront cost and a poorer long-term outcome.

References

Mannetje, L t', and Haydock, K P (1963). The dry weight rank method for the botanical analysis of pasture. *Journal of the British Grassland Society* 18, 268-275.