

## Tall fescue benefits beef cattle near Manjimup

<b>Name:</b>	David, John and Danielle Mottram
<b>Farm Location:</b>	'Rockbridge' Quinninup, 30 km south east of Manjimup, WA
<b>Farm System:</b>	Cattle and Poll Dorset stud. Target market baby beef sold direct off cow.
<b>Rainfall:</b>	800+ mm
<b>Farm Area</b>	280 ha
<b>Perennial Species Sown:</b>	12 ha sown to Quantum (summer active) tall fescue at 12 kg/ ha and Palestine Strawberry clover at 2 kg/ ha
<b>Sowing time:</b>	June 2007
<b>Soil type:</b>	Karri loam over clay; deep river loam

### Key Points

- **Summer active tall fescue extends the growing season**
- **Tall fescue pasture production doubles that of improved annual pasture**
- **Tall fescue allows a 50-100% increase in carrying capacity**

### Background:

The Mottram family have been farming near Manjimup since the early 1900's producing young beef cattle for the domestic market. Until 2006, the farm relied on annual pastures dominated by sub clover and ryegrass with varying amounts of broadleaf and grass weeds. In 2007, John became involved in the "Warren River Project" funded by the WA Department of Water, which is encouraging producers to use perennial pastures in the catchment. The catchment is threatened by salinity unless water tables are reduced by increasing the proportion of perennials in the region.

John was keen to see if perennial pastures would provide production and financial benefits to his beef cattle system. Summer active Tall Fescue (Quantum) was chosen to extend the growing season in autumn and spring so that stock remained on quality green feed for longer. This way, calves could be sold straight off the cows at a good weight. Summer active tall fescue can also use summer rain and reduce hand-feeding during the summer-autumn period. The region usually gets one good thunderstorm so John wanted a species which could turn the rain into quality feed. In addition to the sown perennials, the tall fescue pasture also includes volunteer annuals such as sub clover and ryegrass.

In this comparison, the production and financial benefits of the tall fescue have been compared with annual pastures of predominantly sub clover and annual ryegrass. Both the "improved" annual pasture and tall fescue received 18kg/ha phosphorus and 22kg/ha sulphur in autumn 2009. The "unimproved" pasture was not fertilised in 2009.

## Benefits to animals:

**Increased pasture utilisation** – Total utilisation of tall fescue was 14,600 kg DM/ha (Table 1). This figure included fodder production of 2t DM/ha and was double that of an adjacent improved annual pasture and nearly four times greater than unimproved annual pasture.

John felt utilisation of tall fescue was high as it provided a ‘feed wedge’ at times when feed from annual pastures was low. This fitted well with his annual pasture system as in spring he was able to use the surplus from tall fescue for fodder and graze the annuals when they were of high quality.

*Table 1: Pasture utilisation of tall fescue, “improved” and “unimproved” annuals; 2008.*

Pasture Type	Pasture consumed (kg/ha)	Fodder harvested (kg/ha)	Total utilisation (kg/ha)
Unimproved annual	3,800	0	3,800
Improved annual	2,500	4,600	7,100
Perennial – Tall Fescue	12,600	2,000	14,600

**Higher stocking rate** – Grazing tall fescue enabled a stocking rate double that of the adjacent annual pasture paddocks in the first few seasons and nearly double the district average of 12.5 dse/ha (Table 2). This result backs John’s reasons for selecting tall fescue – to get additional out-of-season grazing. It indicates more grazing availability throughout a whole season not just during winter and spring.

*Table 2: Carrying capacity of tall fescue compared to annual pasture; autumn 2008 to summer 2009.*

Stocking rate	Improved annual pasture	Quantum tall fescue
DSE grazing days per hectare	4,400	8,900
DSE per hectare	12	24

**Flexible stock management** – Tall fescue has provided more options for fattening stock, reduced supplementary feeding during summer-autumn and provided a system better matched with autumn calving. Table 3 shows the ground cover % and green herbage % in different seasons. The green feed in summer and autumn from tall fescue allows John flexibility in his grazing system.

*Table 3: Ground cover and green herbage for tall fescue and annual pastures; 2009.*

Measurement	Tall Fescue			Annual Pasture		
	Summer	Autumn	Winter	Summer	Autumn	Winter
% Ground cover	88	75	98	95	95	100
% Green herbage	83	58	98	0	1	100

## Environmental benefits:

**More efficient use of resources** – there appears to be more efficient use of resources with the tall fescue pasture than either annual system. Deep rooted perennial pastures can access soil water from greater depths than annuals potentially reducing salinity. (Ground water use is being tested at this site but results are not available to date). In addition, the tall fescue pasture has shown more efficient utilisation of nutrients per unit of dry matter production. This may have implications for lighter soils where mobilisation of fertiliser, especially nitrogen and phosphorus is an issue.

## Production and costs;

**Establishment** – Establishment costs of perennials at this site were higher than expected for plantings in this region. Very low pH (due to previous dominance of annual clover pastures) and soil phosphorus resulted in high up-front costs. The seed is also expensive (about \$11/kg). Allowance has been made for lost grazing during establishment in the cash flow analysis as the paddock cannot be grazed for several months after sowing.

Table 3: Establishment costs of tall fescue, June 2007.

Activity	Actual costs \$/ha
Lime	\$60
Fertiliser	\$92
Chemical	\$20
Strawberry clover	\$15
Tall fescue seed	\$135
Contract seeding and spraying	\$55
<b>Total costs</b>	<b>\$377</b>

## Financial benefits;

The benefits to the Mottram's farm come from being able to run the same stock on less area which allows for further perennial establishment or cropping this land. Reduced supplementary feeding has also been required on the perennial system.

A discounted cash flow analysis of the returns from the perennial and annual systems over 10 years has been undertaken with full details of assumptions and the different systems tested shown in Appendix 1. These scenarios were initially undertaken to compare the establishment cashflow of the tall fescue with the annual pastures (Figure 1) and then extrapolated across the whole farm (Figure 2).

Three scenarios were tested;

- *Business as usual (BAU)*; assumes annual pasture is used with 12 DSE/ha, no perennials.
- *Scenario 2*; 8% perennials @ 18 DSE/ha (50% higher than annuals)
- *Scenario 3*; 20% perennials @ 24 DSE/ha (stocking rate achieved in 2008-09)

Both the scenarios tested have a positive cash flow compared with BAU (Figure 1) after 10 years. Scenario 2 with a lower increase in stocking rate takes 4 years to break even with BAU. Scenario 3 where the stocking rate is 24 DSE/ha on the perennials (achieved in 2008-09) generates a higher cash flow than BAU after 3 years. This scenario has the same total DSE with some of the benefit coming from extra land able to be used for cash crops. However, this analysis needs to be considered across the whole farm enterprise mix to appreciate the full impact (Figure 2).

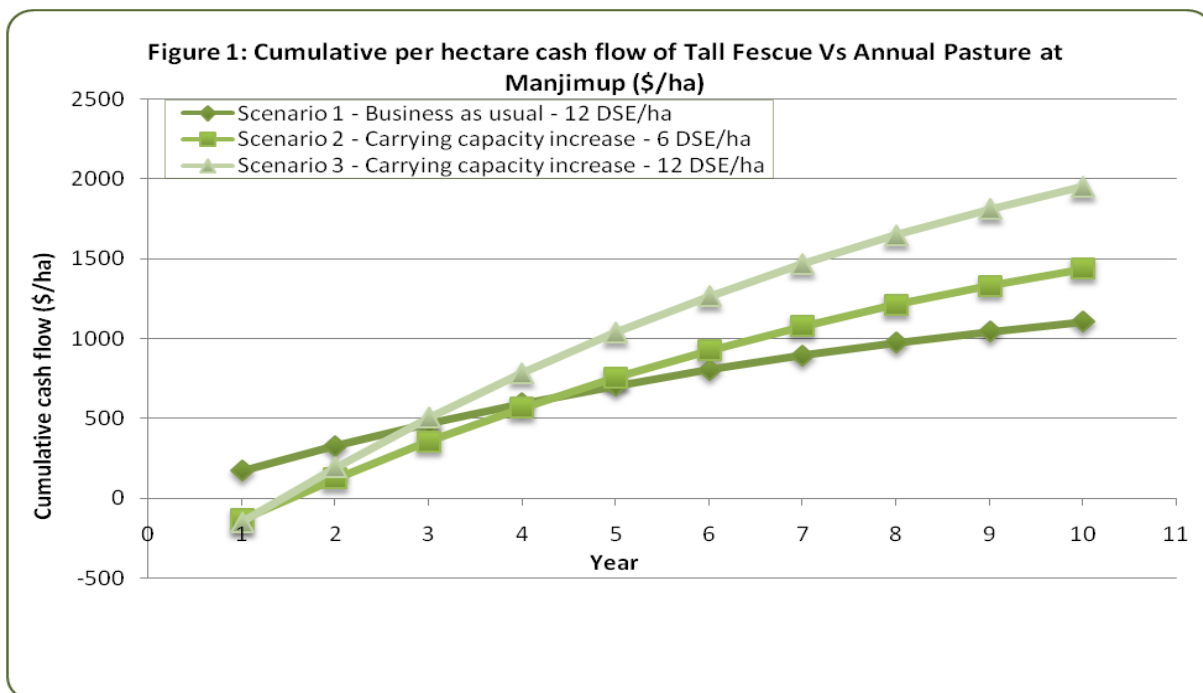
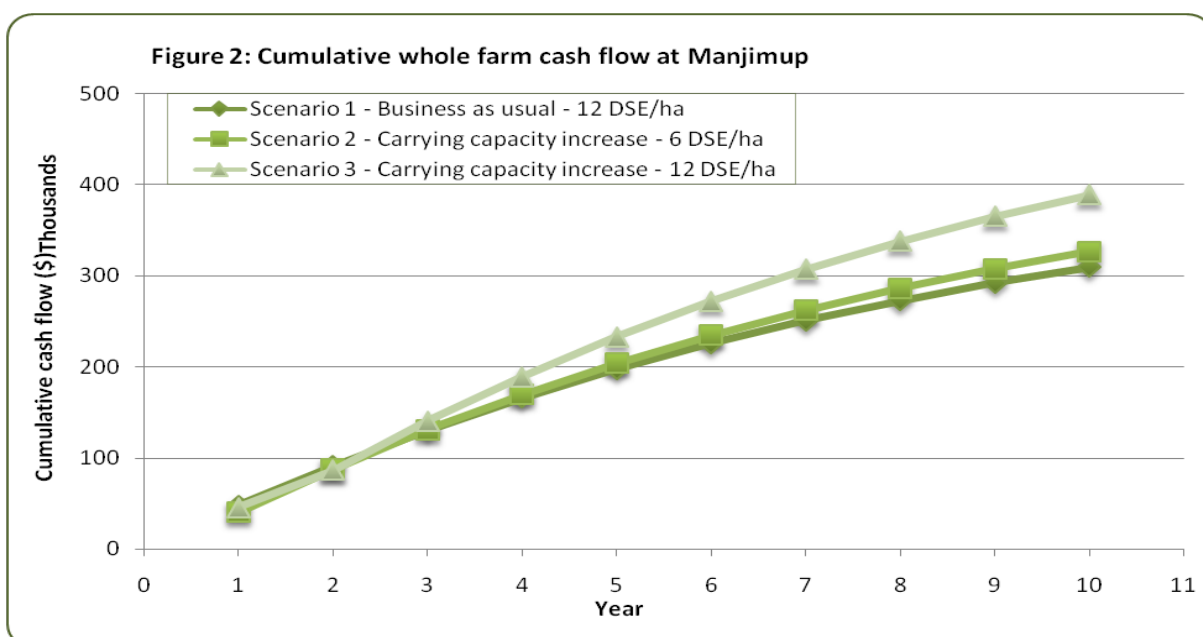


Figure 2 shows a whole farm comparison of Business as Usual (BAU) as well as the two alternative scenarios. Scenario 3 returns \$79K great cash flow than BAU over a 10 year period. Scenario 2 (smaller perennial area) has a smaller surplus (\$17K) compared to BAU. The reason for this lower result is the large up-front costs of sowing perennials especially fertiliser and lime and that the higher stocking rate is not achieved in the first year when the costs are incurred. While Scenario 3 also does not achieve the higher stocking rate in the first year, it has a significant proportion of cash crop (20%) producing additional cash flow. Note that the cash flows in this analysis do not take into account environmental benefits such as reduced erosion and salinity risks. There are also likely to be benefits from reduced supplementary feed-out costs and possibly higher per head production from the perennial pastures and these have not be factored into the comparisons.



## Future Plans:

John has already increased his area of perennials to 22 ha and has plans to have about 50% of the farm under perennials within five years. He aims to introduce species, such as lucerne to widen the green feed window on the farm and increase the flexibility of the vealer production system even further.

## ACKNOWLEDGEMENTS

The information provided in this case study is based on results, data and observations made by the Mottram's on their farm. We thank them for inviting EverGraze and the Warren River project to work on their farm and undertake local studies on how perennials work in their situation.

This analysis and report was undertaken by Paul Omodei, agVivo Manjimup. Stephanie Carstairs from agVivo at Manjimup undertook much of the research and initial preparation of the reports. Ashley Herbert, Agrarian Management, Katanning WA provided feedback and input to the development and analysis of this case study.

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## APPENDIX 1 - Assumptions and scenarios tested

### Financial Model

The financial model used is a 10 year discounted cash flow which incorporates a whole farm approach (cropping and livestock) to the use of perennials. The whole farm approach allows for changes to enterprises mix to be calculated which is important for regions where crop and livestock are options.

### Assumptions

The main assumptions used in the model are as follows:

1. The grazing enterprise is a breeder beef operation.
2. Perennials are sown in autumn so loss of grazing during establishment is included as a cost.
3. Autumn sown perennials achieve 33% of the predicted gross margin in the first year due to the lack of grazing of the pasture during establishment.
4. Perennial Fescue pasture lasts for 10 years.
5. A discount rate of 5% is used.
6. Annual pastures are stocked to ensure that pastures are not over-grazed.
7. Gross Margin \$15/DSE for annual pastures and \$20/DSE for perennial pastures (lower supplementary feed requirements). These lower values reflect the lower current returns for beef compared to sheep.
8. Cropping gross margins \$350/ha per annum.
9. No additional calving percentage or high prices for vealers or numbers of vealers sold. Gains are in stocking rate only (conservative approach).
10. Perennial areas are not cropped and are used solely for grazing.
11. Stocking rate has been calculated in DSE/ha from paddock records of cattle in and out of the perennial and annual pastures and is expressed in Winter Grazed Hectares.
12. Fencing and ground preparation have been removed from the up-front establishment cost calculation as these provide long-term benefits and requirements will vary from farm to farm.

## Model Scenarios

### Scenario 1 - Business as usual - 12 DSE/ha

Farm enterprise runs 12 DSE/ha with no perennials or cash crops.

Enterprise	%	Area (ha)	Stocking rate DSE/ha	Total DSE
Cropping	0	0		
Annual Pasture	100	280	12	3360
Perennial Pasture	0	0	0	0
<b>Total</b>	<b>100</b>	<b>280</b>	<b>12</b>	<b>3360</b>

### Scenario 2 - Carrying capacity increase – 6 DSE/ha

Farm runs 22 ha of perennials (8% of farm) at 18 DSE/ha and a small amount of cash crop.

Enterprise	%	Area (ha)	Stocking rate DSE/ha	Total DSE
Cropping	4	11		
Annual Pasture	88	247	12	2964
Perennial Pasture	8	22	18	396
<b>Total</b>	<b>100</b>	<b>280</b>	<b>12.6</b>	<b>3360</b>

### Scenario 3 - Carrying capacity and perennial area increase - 12 DSE/ha

Farm has 20% perennial at 24 DSE/ha, includes 20% cropping, overall stocking rate 15 DSE/ha.

Enterprise	%	Area (ha)	Stocking rate DSE/ha	Total DSE
Cropping	20	56		
Annual Pasture	60	168	12	2016
Perennial Pasture	20	56	24	1344
<b>Total</b>	<b>100</b>	<b>280</b>	<b>15</b>	<b>3360</b>