

# final report

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## **Techniques to increase beef production on pasture**

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## Background

Traditionally Kangaroo Island farmers have carried out set stocking systems for both sheep and cattle enterprises. Research across Australia and the world has shown that a rotational or cell grazing system will increase plant production due to increased leaf area, as a result of resting pasture. On correctly run systems beef production is greatly increased.

These systems vary greatly from a simple 4 paddock weekly rotation to sophisticated systems involving daily shifting with extremely high stocking pressures. Ultimately profit is driven by Kg of beef produced per hectare. These types of systems allow greater pasture production and potentially higher levels of beef production if high quality pasture can be maintained. The aim of this trial is to use a simple and cheap system to increase pasture utilisation and increase levels of beef produced per Hectare.

## Project Objectives

The objectives of this project are designed to align with the objectives of the South Australian Beef Industry Strategy.

1. Lift pasture utilisation by 10%, for the current estimated levels of 30%
2. Increase the kilograms of liveweight produced to 300kg/ha, from a current average level of 150kg/ha/year
3. Increase member's understanding of feed budgeting, with the assistance of the Grazfeed® computer program and the MLA More Beef from Pastures manual and Feed Demand Calculator.
4. To provide a simple grazing system demonstration to other livestock producers (sheep and cattle) on the Island.

## Methodology

In 2006 a 40ha pasture paddock on the property of Bruce & Alison Buck of Gosse, Kangaroo Island, was divided into 4 equally sized paddocks. Each paddock was fenced with a single hot wire and drinking water supplied from a dam, fenced off to allow access from each paddock as required.

The cattle first entered the system in May 2006. 30 cows and 32 calves were run in this system on a weekly rotation with each paddock having a 21 day rest period. This gave an average adjusted stocking rate of 9.5 DSE/ha compared to the 10DSE/ha stocking rate of the control mob. The production of the cattle in the trial has been compared with the control mob which included the rest of the cattle on the property that have been run on a more traditional set stocking regime.

The cattle were removed from the trial paddock in March 2007 for a 2 month period as a result of the failed 2006 spring to prevent permanent damage to the pastures.

On the 25<sup>th</sup> May 2007 40 Cows and 40 Calves were put back into the 1<sup>st</sup> paddock and started a weekly rotation, allowing each paddock a 21 day rest period as had happened previously. This increase in numbers of stock resulted in a 2007 adjusted stocking rate of 15 DSE/Ha up from 9.5 DSE/Ha the previous year.

In April 2008 an additional 5 cows and calves were added to the system which increased the stocking rate to 20 DSE/Ha with the same management system as the first two years of the trial.

**Results**

In each year of this trial the stocking rate has been increased and we have seen an increase in production as a result. This trend was once again seen in 2008 with an extra 66kg/beef/Ha produced from last year with the trial mob producing an extra 216kg/beef/Ha than the control mob.

Figure 1 compares beef produced by the vealers over the three years of the trial. In the first year the stocking rates and individual animal average weight (See Table 1) were similar between the control and the trial however the cows put on a lot more weight in the trial than the control. In 2008 the stocking rate was double the rate in 2006 and the kg/beef/ha has nearly doubled as well.

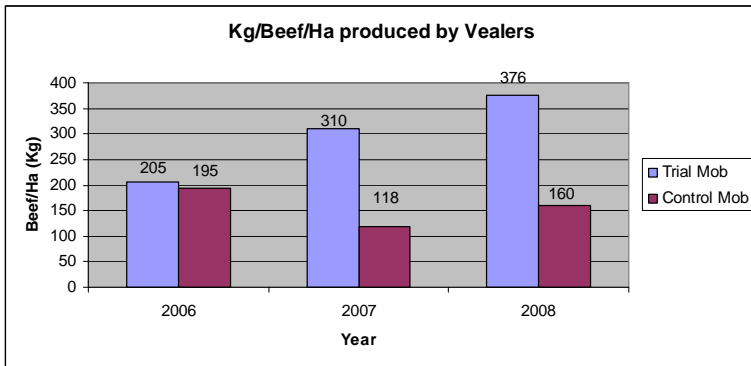


Figure 1: Yearly comparison Kg/Beef/Ha (Data in Appendix 1)

The cows in the trial have lost on average, 67kg of live weight over the period of the trial compared to the cows in the control which have gained on average 16kg live weight. This partly can be attributed to the fact that they were carrying extra condition coming out of the first spring but also shows the extra pressure that can be placed on a cow and not lose production from their calves. The cows have been maintained around the recommended condition score 2 for the duration of the trial however they were probably maintained at condition score 3 before the trial.

During 2008 the average vealer live weight in the control mob was actually higher than the trial mob unlike the first two years of the trial (See Table 1). This is most likely due to the intensity of the grazing system in the trial; the stocking pressures applied during 2008 in this trial were at a level that things can go backwards really quickly. Shifting the cattle a day or two late on a couple of occasions has much bigger repercussions in an intensive system like this than in a traditional set stocking system. It must be remembered though, individual animal weights are not as important as total production levels over each hectare on the property. In the case of the trial the majority of animals in the trial still reached the target weight of 300kg to meet the targeted market specifications. It is always important to meet the specifications of your target market to ensure a sale, however the more beef that can be produced the greater the economic gains that are achieved.

Average Vealer Weights (Kg)					
Trial Mob			Control Mob		
Ave 06	Ave 07	Ave 08	Ave 06	Ave 07	Ave 08
332	372	327	332	342	335

Table 1: Yearly comparison of vealer live weights.

This increase in production has resulted in much improved financial gains from these cattle in the trial as well. In 2007 the vealers in the trial mob produced an extra 192kg/ha than the trial

mob. In 2008 the production increase was 216kg/ha, with current market prices at \$1.70/kg this has increased returns by \$326/ha in 2007 and \$367/ha. Over the last two years of the trial the vealers in the trial returned an extra \$693/ha than the vealers in the control that were set stocked at about 10 DSE/ha. If we multiply this return out over the 40ha of the trial the increased return by the vealers in the trial is \$13,860/year, a very impressive result.

The rest period throughout the season provides the plants with a chance to recover from the intensive grazing from the cattle. The rest period is only short and thus the feed on offer to the cattle remains high quality for the duration of the season. Once the feed stops growing at the end of the season the feed quantity decreased at a greater rate than the rest of the property due to the higher stocking rate. In a simple four paddock system like this one there is probably going to be a necessity for extra summer feeding than in a lower stocked set stocking system. The trial was finished in February 2009 and the results have really proved the advantages that can be gained by simple management changes.

In September 2006, 60kg/ha Urea was applied to 2/3rds of each of the 4 paddocks in the trial area with the aim of increasing plant production. The Urea application in 2006 was not real successful due to limited rainfall after application resulting in only small gains noticed. After the results were collated in 2006 it was decided not to apply Urea in 2007 and keep the rotation as the only variation from a traditional set stocking system.

## Discussion and conclusions

Pasture Utilisation is one of the key drivers to increase production levels; one of the objectives of this trial was to lift pasture utilisation by 10% from the current levels of 30%. From calculations undertaken during this trial using the MLA Feed Demand Calculator, pasture utilisation in the final year of this trial was 44%. Although this is still below the 50% level which is recommended to aim at by the MLA more beef from pastures manual it is a significant improvement from the baseline figures at the start of this trial. Thus by improving the pasture utilisation by 14% we achieved the first objective of the trial.

It is really clearly shown in Figure 1 that we were able to lift kg/beef/ha from current levels to a target level of 300kg/ha. This level was achieved in the second year of the trial and last year that level was well exceeded with 376kg/ha achieved. The control levels ranged from 118 - 195kg/beef/ha over the duration of the trial, interestingly the best levels were achieved in the control mob in the first year of the trial.

As a beef group we have spent time using the MLA More Beef from Pastures manual and the tools associated with this manual during many of our workshops, field walks and general discussions. The tools that have been used include the Feed Demand Calculator, Cost of Production calculator, Rainfall to Pasture Growth Outlook Tool and the Pasture Ruler. The Grazfeed™ computer program was used in data collation before yearly reports were written.

During this PIRD we have successfully demonstrated how a simple grazing system can greatly improve beef enterprise production levels. In this case we only looked at the effect on cattle a system like this can have, however the principals would follow through to sheep with similar results expected. This system was simple in design, cheap in construction (single hot wire and star droppers) and lower labour requirements than a full-on cell grazing system (Weekly instead of daily rotations).

This trial has shown that significant production improvements can be achieved from a simple system like this. In the future we will continue to use at least one, probably multiple small systems like this within our property. Because of our enterprise and business structure we do not want to completely change over to a cell grazing system; however this will allow great production increases whilst still allowing management flexibility. It is my belief that using this

type of system will result in our cattle providing greater returns to our business than our prime lamb enterprise currently can.

In addition, several Kangaroo Island group members are now investigating how they may be able to establish a rotational grazing system on their own properties. The trial has shown the local Island community how productivity levels can be increased through the use of simple fencing technology and the application of some simple pasture grazing principles (taken from the MLA More Beef from Pastures manual).

The results obtained over the last two years have shown that significant economic gains are achievable. Any system that results in an increase in production of the desired commodity without any great increase in cost will have significant economic gains. There was an increase of production of 192kg/ha in 2007 and 216kg/ha in 2008, at \$1.70/kg liveweight this provides increased returns of \$326/ha and \$367/ha respectively. There are small capital outlays to set up a system like this and small increases in labour requirements, however even small systems like the one in this trial greatly improve the bottom line for businesses.

In this particular system the pastures are predominantly perennial ryegrass based, it has been proven that perennial ryegrass has large environmental benefits in the form of reduced erosion and increased water use efficiency. It has been noticeable over the three years of the trial the increase in individual plant size as a result of providing the plant with rest periods after grazing. We have other perennial ryegrass plants in paddocks on the property planted at similar times which have been set stocked; the past few tough seasons have really affected these stands. Plant numbers in these paddocks have started to decline and the individual plant size is not increasing significantly. These positive performances from the ryegrass in the trial have thus had significant environmental gains as well.

At the start of the trial we had a concern of the cattle 'pugging' up areas as a result of the increased stocking rate. We have not had any really wet winters during this trial however the short periods in paddocks and good plant cover has resulted in minimal pugging occurring. Even if the trial was conducted with annual based pastures it is still my belief that there would be significant environmental gains from the increased plant cover, rest periods for the plants and increased production which increased water use.

The KI beef group has had 3 field walks to look at the trial over the past three years. Each of these field walks has involved discussions on what has been happening and the results achieved so far and also what changes and alternatives are on the cards for the future. Generally we have had about 5-10 local producers at these walks. The Kangaroo Island Young Farmers Group and the last Prograze™ group on the island have both had field days at the trial site where discussions have been held on the success of the trial and future possibilities. These groups generally have been about 10-15 people each time which has generated some really good discussions from some of Kangaroo Islands young farmers who are keen to learn and discuss best practice and new options.

The results from this trial show that things were done well throughout the duration of the trial. There are some small management issues which probably caused some small losses in production, particularly in the last year of the trial when the stocking rate was at its highest. The water available to the stock was supplied from a central dam, in the summer this water became muddy and not fresh. Better results would possibly have been achieved if troughs were used with fresh clean water available throughout the summer. We possibly could have also achieved higher stocking rates and kg/beef/ha by increasing the number of paddocks and thus the rest period in the rotation however this increased the complexity of the system and so it was decided to leave it at a four paddock system.

Overall this trial has been a successful demonstration to members and other farmers on Kangaroo Island the benefits of a simple rotational grazing system. Over the duration of the trial

we have successfully achieved each of the objectives set out in the trial application and it has been a valuable learning exercise for members of the group. Simple demonstrations like this one are a great way for producers or other groups to demonstrate the possible benefits of management changes. They also provide good opportunity for groups to access new information that they may not have had access to previously.

The overall organisation and management of this PIRD has been reasonably good through most of the trial. At the start of the trial we had problems getting finances and contracts signed and it wasn't until half way through the second year of the project that this was all finalised. Since the finalisation of the project the communication and assistance has been very good, the finances were sorted out and the coordinator has been of good assistance as required.

## Appendix 1 - Data

## Kg/Ha Beef produced by Vealers

	Trial Mob			Control Mob		
	2006	2007	2008	2006	2007	2008
<b>Total Kg</b>	8217	14896	15023	13751	16819	17777
<b>Hectares</b>	40	*48	40		143	111
<b>Kg/Ha</b>	205	310	376	195	118	160

\*The variation in Hectares for the trial mob in 2007 is to compensate for periods out of the trial site - calculated using grazfeed.

Average Vealer Weights (Kg)					
Trial Mob			Control Mob		
Ave 06	Ave 07	Ave 08	Ave 06	Ave 07	Ave 08
332kg	372kg	327kg	332kg	342kg	335kg

Average Vealer Weights for each of the years of the trial.



## Appendix 2 – Press Coverage

### 2006 KI Agriculture Trial Results (Rural Solutions SA Publication).

#### Rotational Grazing of Beef on Kangaroo Island

##### Background

Traditionally Kangaroo Island farmers have used a set stocking system for both sheep and cattle enterprises. Much research across Australia and the world has shown that a rotational or cell grazing system will increase plant production due to increased leaf area. On correctly run systems beef production is greatly increased.

These systems vary greatly from a simple 4 paddock weekly rotation to sophisticated systems involving daily shifting with extremely high stocking pressures. Ultimately profit is driven by Kg of beef produced per Ha, these types of systems tend to allow greater pasture production and potentially higher levels of beef production if high quality pasture can be maintained. The aim of this trial is to use a simple and cheap system to increase pasture utilisation and increase levels of beef produced per Hectare.

##### What was done?

A 40 Ha pasture paddock on the property of Bruce & Alison Buck, Gosse was divided into 4 equally sized paddocks. Each paddock was fenced with a single hot wire and the water supplied from a dam that was fenced off to allow access from each paddock as required.

The paddock was shut up on the 9<sup>th</sup> Jan with no stock running on it until the 5<sup>th</sup> May when 30 cows and 32 calves (Mar – May Drop) were put into the first Paddock.

A fortnight later pasture composition data was collected and it was estimated that there was an average of 3200kg/Ha green dry matter available to the cows. The pasture composition was 44% perennial grasses, 25% clover & 11% broadleaf weeds, a feed test was taken at the same time and showed the protein at 19.6% and the ME at 11.4MJ.

These cattle were shifted every week into the next paddock in the rotation to allow

every paddock to have a 21 day rest period. This rotation remained constant throughout the whole year with only slight variations depending on pasture availability. There has been no substitute feeding in the system since the start of the rotation.

60kg/Ha urea was spread on the 5<sup>th</sup> September across 2/3rds of each of the paddocks, good rain was received immediately. Unfortunately the early end to spring meant there was limited extra production from the Urea; the only change was a noticeable difference in plant leaf colour.

14 vealers came out of the system on the 31 December averaging 397kg live weight. The other 18 vealers came out of the system on the 28<sup>th</sup> January averaging 333kg live weight.

##### Results

The production from the cattle in the trial has been compared with the production of the rest of the cattle on the property which have been run in 1 mob (Main mob) for the whole season.

The cattle in the trial were stocked at an average of 9.4 DSE/Ha across the year and the control mob was stocked at approximately 10.1 DSE/Ha.

*Table 1* indicates that although the trial mob was run at a slightly lower stocking rate it still produced an extra 76kg/ha beef. It is interesting to note the difference in beef produced by the cows in the two mobs. There was only 10kg/ha difference in the production by the vealers.

*Table 2* shows the vealer growth rates were very similar across the two mobs - however the main mob carried its growth rates through later into the season due to the greater flexibility with paddock selection.

Table 1:

Beef produced in 2006. (Trial mob - 30 cows, 32 calves, Main mob - 48 Cows, - 50 calves)

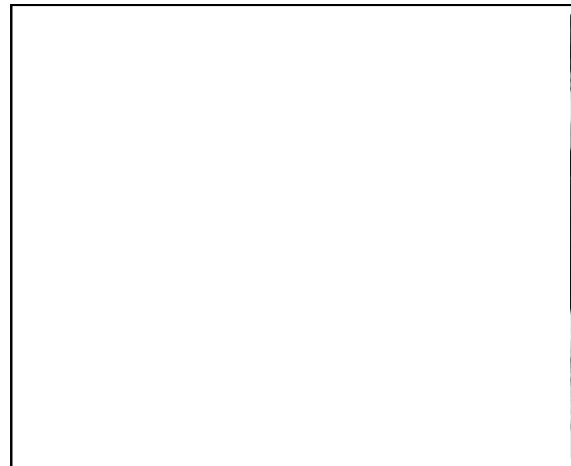
	Trial Mob		Main Mob	
	Beef Produced	Kg/Beef/Ha	Beef Produced	Kg/Beef/Ha
Cows	4,287kg	107	2,981kg	42
Vealers	8217kg	205	13,751kg	195
<b>TOTAL</b>	<b>12,504kg</b>	<b>313</b>	<b>16,732kg</b>	<b>237</b>

Table 2: Daily growth rates between weigh periods

Weigh Date	17 Aug	1 Nov	15 Dec	18 Jan
Ave Weight Gain (kg/day) - Trial	1.1	1.4	0.9	0.1
Ave Weight Gain (kg/day) - Main Mob		1.4	1.1	0.5

Overall there was not a big difference in the production of the two different mobs; it is suspected that the rotation may not have been long enough to allow full pasture recovery during grazing periods. Increased recovery periods would allow greater leaf area on the plants and better utilisation of available moisture, increasing plant production.

The project continues in 2007 with the stocking rate being increased to 15DSE/Ha in order to push the system further and determine the maximum carrying capacity and beef production of this type of system.



1 For further information contact:

- Tim Buck, Project Manager  
PH 8559 3135 MOB 0428 593 217

Funding/Sponsors:

- MLA more beef from Pastures-producer demonstration project
- Kangaroo Island Natural Resources Management Board
- KI Beef Group
- National Landcare Program

Take Home Message:

- Cell grazing should be able to support an increased stocking rate in the trial mob because the cows produced significantly more Kg/beef/ha than the main mob.
- The next two years of the project will start to show more detailed results

## 2007 KI Agriculture Trial Results (Rural Solutions SA Publication)

### Rotational Grazing of Beef on Kangaroo Island

#### Background

Traditionally Kangaroo Island farmers have carried out a set stocking system for both sheep and cattle enterprises. Research across Australia and the world has shown that a rotational or cell grazing system will increase plant production due to increased leaf area and on correctly run systems, beef production is greatly increased.

These systems vary greatly from a simple 4 paddock weekly rotation to a sophisticated system involving daily shifting with extremely high stocking pressures. Ultimately profit is driven by the kilograms of beef produced per hectare. These types of systems tend to allow greater pasture production and potentially higher levels of beef production if high quality pasture can be maintained. The aim of this trial is to use a simple and cheap system to increase pasture utilisation and increase levels of beef produced per Hectare.

#### What was done

In 2006 a 40 Ha pasture paddock on the property of Bruce and Alison Buck, Gosse, was divided into 4 equally sized paddocks. Each paddock was fenced with a single hot wire and the water supplied from a dam that was fenced off to allow access from each paddock as required.

The cattle first entered the system in May 2006. 30 cows and 32 calves were run in this system on a weekly rotation with each paddock having a 21 day rest period. This gave an average adjusted stocking rate of 9.5 DSE/ha compared to the 10DSE/ha stocking rate of the control mob. The production of the cattle in the trial has been compared with the control mob. This included the rest of the cattle on

the property that have been run on a more traditional set stocking regime.

The early spring finish in 2006 and the lack of summer rains meant the cows and calves were starting to damage the crowns of the plants in March 2007. After a discussion with members of the KI Beef Group it was decided the cows should be taken out of the system until the break of the season. The cows were removed from the system on the 21<sup>st</sup> of March 2007 and the paddock was completely free from stock until the 25<sup>th</sup> of May. 40 Cows and 40 Calves were put into the 1<sup>st</sup> paddock and started a weekly rotation, allowing each paddock a 21 day rest period. The cows that were in the system last year were all returned to the system this year to help reduce genetic variability between years. Everything was kept as close as possible in 2007 to 2006 except for the increased stocking rate.

#### Results

In 2007 the stocking rate of the trial was increased to 15DSE/ha whilst the stocking rate of the control mob was 10DSE/ha. The first 14 vealers were removed from the system on the 13<sup>th</sup> February 2008 averaging 354kg, 20 more vealers were removed on the 23<sup>rd</sup> February averaging 385kg and the last 6 were removed on the 27<sup>th</sup> February averaging 387kg. Despite this increase in stocking rate it can be seen in Table 1 that significantly more beef/ha has been produced by the trial mob than by the control mob.

In 2006 the increased beef production from the trial mob was mainly seen in the cows and there was not a great difference in production from the vealers although the cows in the trial produced more than double the

	Trial Mob		Control Mob	
	2006 Kg/Beef/Ha	2007 Kg/Beef/Ha	2006 Kg/Beef/Ha	2007 Kg/Beef/Ha
<b>Cows</b>	107	185	42	60
<b>Vealers</b>	205	310	195	118
<b>Total</b>	<b>312</b>	<b>495</b>	<b>237</b>	<b>177</b>

Table 1: Comparison of beef produced in 2006 and 2007 of both mobs

amount produced by the cows in the control. The average selling weight in the trial mob was 372kg compared to 335kg in the control. There was a much larger tail in the control mob with a number of calves not making sale weight. Table 1 shows that this year the vealers in the trial have produced an extra 105kg/ha more beef than last year and an extra 192 kg/ha than the control mob. With current beef prices at \$1.70/kg live weight this is an extra \$178/ha more than last year and \$326/ha more than the control mob this year.

It can also be seen from Table 1 that the cows in the trial have still significantly increased their weight throughout the year, whilst the cows in the control mob have kept a similar weight throughout the year.

The rest period throughout the season provides the plants with a chance to recover from the intensive grazing from the cattle. The rest period is only short and thus the feed on offer to the cattle remains high quality for the duration of the season. Once the feed stops growing at the end of the season the feed quantity decreased at a greater rate than the rest of the property due to the higher stocking rate. In a simple four paddock system like this one there is probably going to be a necessity for extra summer feeding than in a lower stocked set stocking system. So far this summer there has not been much more feeding

of the cattle in the trial than the control mob.

The trial will continue throughout 2008. When the season breaks, the stocking rate will be increased again with a proposed increase in stocking rate towards 20DSE/ha. Some potash will be applied (based on soil test results) and there may be some more trial work done with the plant hormone ProGibb®.

For further information contact

- Tim Buck, Project manager, 0428 593 217
- Tim Prance, Rural Solutions SA, 0427 812 655

Funding/Sponsors

- MLA: more beef from pastures: producer initiated research development grant
- KI Beef group
- KI NRM board
- National Landcare program

Take Home Message

- Ensuring high quality feed on offer will increase production
- High stocking rates can be achieved from a simple rotational grazing system
- Increasing the stocking rate prevented the cows putting on extra weight and still allowed the vealers to produce high levels
- The system can still be pushed further!

# Stocking rate gains on KI

## Key points

- Four 10ha paddocks used in rotation
- 21-day rest period for each paddock
- Trial run for the past two years

**B**OOSTING the stocking rate has earned a Kangaroo Island farming family an extra \$326 a hectare.

By going from 10 dry sheep equivalent/ha to 15 DSE/ha, the Buck family, Parndana, has produced vealers weighing 192 kilograms/ha more than the control mob.

The rotational grazing trial was set up by Bruce, Alison and Tim Buck to increase pasture use and lift beef production in a simple, cheap and low-maintenance system.

Trial vealers were sold in February, when the liveweight price of \$1.70/kg meant they were worth an extra \$326/ha than the control mob.

"The cows in the trial have gained significant amounts of weight each year, so stocking rates have been increased to allow the vealers greater access to the feed and see how far the system can be pushed," Tim said.

In the past two years the trial has been run in a 40ha paddock divided by a hot wire into four 10ha paddocks.

Cows are kept about a week in each paddock before being shifted, allowing a 21-day rest-period for each paddock.

Because of the poor spring and lack of summer rain in 2006-07 were removed the cattle from the system in late March until late May to avoid environmental damage.

In 2007 a mob of 40 cows and calves was run in the trial.

"The results are showing that a simple system like this one can dramatically increase beef production even with really short rest periods," Tim said.

"The 21-day rest seems to be working well



**PRODUCTION TRIAL:** Tim Buck (pictured with his wife Kate) is in the third year of running a livestock trial to increase pasture utilisation and beef production.

while the pasture is growing and through early summer, but with the early finishes we have had in the past two years there have been some feed problems in late summer.

"During this time the rest-period was extended as much as the system allowed, but ideally more paddocks would allow more adequate rest-periods."

The extra production gained from the animals in the trial was a result of the high-quality feed on offer during the growing season.

"The short rotation and high stocking pressure prevents the animals from selectively grazing and thus keeps plants growing at optimum rates for the whole season,"

Tim said.

"Short-growing pastures provide the highest quality feed to animals and any activity that can be done to maintain this type of pasture will allow high animal production."

The trial will continue this year and the stocking rate will be increased to 20 DSE/ha to "really push" the system.

"There is still room for this system to be pushed further whilst still maintaining an environmentally sustainable system," Tim said.

• Details: The trial was supported and funded by the KI Beef Group; KI Natural Resources & Management Board; Meat & Livestock Australia - More Beef from Pastures Program; and the National Landcare Program.



**GRAZING GAIN:** Cows and calves are run in the 40-hectare system on a weekly rotation and at a high-stocking rate to prevent the animals from selectively grazing, and to keep plants growing at optimum rates for the whole season.

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## 2008 KI Agriculture Trial Results (Rural Solutions SA Publication)

### Rotational grazing with beef on Kangaroo Island

#### BACKGROUND

Traditionally Kangaroo Island farmers have carried out set stocking systems for both sheep and cattle enterprises. Research across Australia and the world has shown that a rotational or cell grazing system will increase plant production due to increased leaf area and, on correctly run systems, beef production is greatly increased.

These systems vary greatly from a simple four paddock weekly rotation to sophisticated systems involving daily shifting with extremely high stocking pressures. Ultimately, profit is driven by the kilograms of beef produced per hectare. These types of systems allow greater pasture production and potentially higher levels of beef production if high quality pasture can be maintained. The aim of this trial was to use a simple and cheap system to increase pasture utilisation and increase levels of beef produced per hectare.

#### WHAT WAS DONE

In 2006 a 40 ha pasture paddock on the Gosse property of Bruce and Alison Buck was divided into four equally sized paddocks. Each paddock was fenced with a single hot wire and the water supplied from a dam that was fenced off to allow access from each paddock as required.

The cattle first entered the system in May 2006. Thirty cows and thirty-two calves were run in this system on a weekly rotation with each paddock having a 21 day rest period. This gave an average adjusted stocking rate of

9.5 DSE/ha compared with the 10 DSE/ha stocking rate of the control mob. The production of the cattle in the trial was compared with the control mob which comprised the rest of the cattle on the property that had been run on a more traditional set stocking regime.

The cattle were removed from the trial paddock in March 2007 for a two month period as a result of the failed 2006 spring to prevent permanent damage to the pastures.

On 25 May 2007 40 cows and 40 calves were put back into the first paddock and started a weekly rotation, allowing each paddock a 21 day rest period as had happened previously. This increase in numbers of stock resulted in a 2007 adjusted stocking rate of 15 DSE/ha, up from 9.5 DSE/ha of the previous year.

The trial continued in 2008 and an additional five cows and calves were added to the system. This increased the stocking rate to 20 DSE/ha with the same management system used in the first two years of the trial.

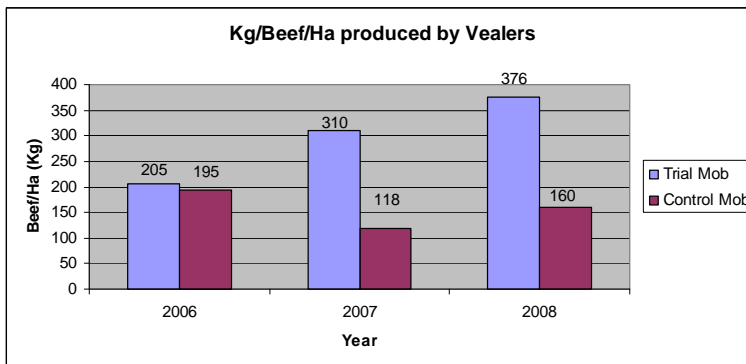
#### RESULTS

In each year of this trial the stocking rate was increased and we saw an increase in production as a result. In 2008 the trial mob produced 216 kg of beef per hectare more than the control mob. In addition, the trial mob, due to the increased stocking rate, produced 66 kg of beef per hectare more than in 2007.

Figure 1 compares beef produced by the vealers over the three years of the trial. In the first year, the stocking rates and individual animal average weight were similar across the control mob and the trial mob. However, the cows

put on a lot more weight in the trial than the control. In 2008 the stocking rate was double the rate in 2006 and the kilogram of beef per hectare nearly doubled as well.

**FIGURE 1**  
**Yearly comparison of kilograms of beef per hectare**



The cows in the trial lost on average 67 kg live weight over the trial period compared with the cows in the control which gained on average 16 kg live weight. This can be partly attributed to the fact that they were carrying extra condition coming out of the first spring but also shows that extra pressure can be placed on cows without losing production from their calves. The cows were maintained around the recommended condition score 2 for the duration of the trial. However, they were probably maintained at condition score 3 before the trial.

During 2008, the average vealer live weight in the control mob was actually higher than the trial mob (see table 1), unlike the first two years of the trial. This was most likely due to the intensity of the grazing system in the trial. The stocking pressures applied during 2008 were at a level where things could go backwards really quickly. Shifting the cattle a day or two late on a couple of occasions had much bigger repercussions in an intensive system like this than in a traditional set stocking system.

Table 1  
**Yearly comparison of vealer live weights**

Average vealer weights in kilograms					
Trial mob			Control mob		
2006 average	2007 average	2008 average	2006 average	2007 average	2008 average
332	372	327	332	342	335

The increase in production resulted in much improved financial gains from these cattle in the trial. In 2008 the

extra 216 kg/ha produced by the trial mob over the control mob increased the returns by an extra \$367 per

hectare using a price of \$1.70 per kg live weight.

The rest period throughout the season provided the plants with a chance to recover from the intensive grazing from the cattle. The rest period was short and thus the feed on offer to the cattle remained high quality for the duration of the season. Once the feed stopped growing at the end of the season, the feed quantity decreased at

a greater rate than the rest of the property due to the higher stocking rate. In a simple four paddock system like this one there will probably be a necessity for extra summer feeding than in a lower stocked set stocking system. The trial was finished in February 2009 with the results demonstrating the advantages that can be gained by simple management change

### Take Home Messages

- Offering high quality feed will increase production
- High stocking rates can be achieved from a simple low cost rotational grazing system
- Increasing the stocking rate prevented the cows putting on extra weight and still allowed the vealers to have good growth rates
- Tailor systems flexibly to suit specific goals of individual producers (store versus finished cattle, rotation length and period, stocking pressures etc)
- Strongly encourage producers to trial a simple system like this to see the results for themselves!

### Funding/Sponsors

- Meat and Livestock Australia: more beef from pastures (producer initiated research development grant)
- Kangaroo Island Beef Group
- Kangaroo Island Natural Resources Management Board
- National Landcare Program

### For further information contact

- Tim Buck, project manager on 0428 593 217
- Tim Prance, Rural Solutions SA on 0427 812 655 or email [prance.tim@saugov.sa.gov.au](mailto:prance.tim@saugov.sa.gov.au)



## New management style boosts production

Trialling a simple time-based rotational grazing system on Kangaroo Island has doubled beef production per hectare in three years.

The Kangaroo Island Beef Group set up the trial in 2006 using MLA's Producer Initiated Research and Development (PIRD) program funding.

Many of its members had completed MLA Prograze courses and were using the More Beef from Pastures (MBfP) manual. They wanted to test the major principles from these resources in the paddock.

The group focused on assessing the potential productivity gains from rotational grazing strategies to better match feed supply, demand and pasture budgeting.

The four-paddock model adopted on Tim and Kate Buck's property followed the system outlined in Prograze and the MLA Tips & Tools publication, *Getting started in simple time-based rotational grazing*.

This type of grazing system is designed to improve pasture production, utilisation and persistence, and to increase livestock productivity and profits through higher stocking rates and production per hectare.

### Key points

- Rotational grazing systems and sound knowledge have the potential to significantly boost beef output per hectare.
- Increased pasture utilisation through higher stocking rates and rotations has lifted beef production by 216kg/ha in three years in the Kangaroo Island PIRD trial.
- Water, additional labour costs and increased feeding costs are the biggest threats to such systems, but can be managed.

Tim said a 40ha paddock was split into four 10ha paddocks using electric fencing during the PIRD trial from 2006 to 2008.

"To keep it simple, we used a 21-day stock rotation with only small variations depending on feed availability," he said.

**"It shows how easily production can be significantly increased just by using a different management style."**

"We used the same model and paddock for the three years of the trial so that stocking rate and management were the major variables compared to the control group of cattle running on the rest of our property."

The long-term average stocking rate on the Buck's property is 9–10DSE/ha, reflecting the district average. They run 150 head of cross-bred cattle (mainly British breed based on Hereford and Red Angus genetics).

In 2006, the trial paddock system supported 30 cow and calf units at an adjusted stocking rate of 9.5DSE/ha. In 2007, this increased to 40 cow and calf units at an adjusted stocking rate of 15DSE/ha.

And in 2008 it supported 45 cow and calf units at a stocking rate of 20DSE/ha.

"These production figures were consistently better than the control group, which remained at 9–10DSE/ha during that time," Tim said.

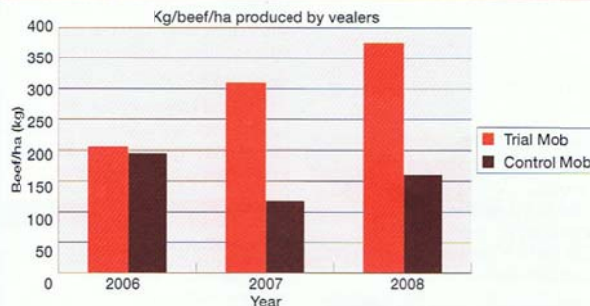
"It shows how easily production can be significantly increased just by using a different management style."

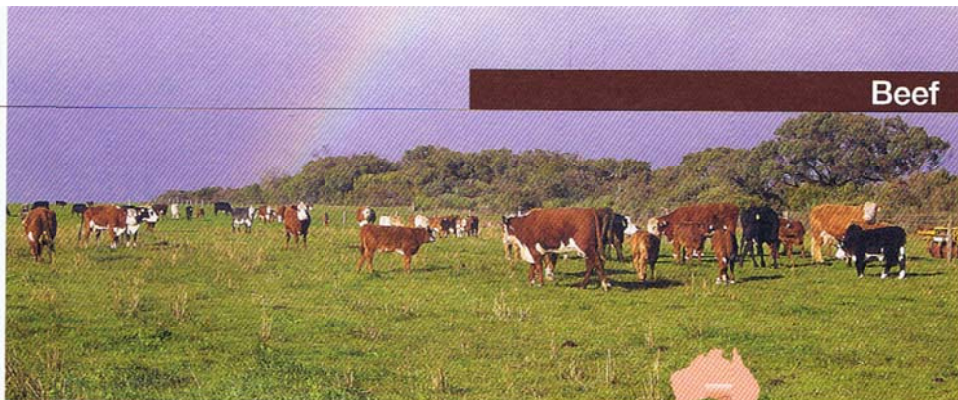
Figure 1 shows that the kilograms of beef produced in the trial system significantly increased from 205kg/ha in 2006 to 375kg/ha in 2008, and was consistently higher than the control group.

Production from the control group fell from 195kg/ha in 2006 to 118kg/ha in 2007 before rising to 160kg/ha last year. This variability was largely due to seasonal conditions.

In 2008, the trial herd produced 216kg/ha more beef than the control herd; priced at \$1.70/kg, this equated to \$367/ha additional income.

Figure 1 Kilograms of beef produced in the trial system





Cattle grazing during the PIRD trial run on Kangaroo Island.

If all Kangaroo Island Beef Group members could achieve production of 300–350kg/ha liveweight from an average base of about 150kg/ha, their collective total gross income gain would be worth about \$1.8–2 million annually.

### Short and high quality

Tim said the pastures in the PIRD trial paddock were 2–3 years old and grass dominant – mainly ryegrass, cocksfoot and some sub clover.

The time-based rotational grazing model was designed to allow a 3-week rest for pastures that maintained active growth and kept them short and high quality.

Tim completed a Prograzé course before the trial started, which he found valuable for estimating dry matter availability and undertaking feed tests.

Other group members had used the computer model Grazfeed and MBfP's Feed Demand Calculator to help determine stocking rates and grazing sequences.

"We found these tools helped us better understand and match feed availability to animal requirements and allowed us to finetune elements of the trial," Tim said.

Pasture species counts, pasture nutritive values and soil tests were conducted in the first year of the trial but not in subsequent years, as the main focus was on pushing stocking rates.

Tim said that the pasture composition at the trial site had shifted to more ryegrass dominance – at the expense of sub clover – because the rotation system was better suited to perennial species.

### Benchmark figures

At the start of the trial, the Kangaroo Island Beef Group was keen to develop pasture growth benchmark figures for grazing pastures on the island, as local pasture growth and stocking rate information was lacking.

Tim said the group still hoped to compile this information from the trial data, but the main outcome had been demonstrating the success of rotational grazing in achieving big increases in pasture utilisation and productivity per hectare.

Tim's family planned to operate such a system in future.

"I think the past 12 months of the trial showed the massive potential of this system; we pushed the stocking rate to the limit for our property," he said.

"We dramatically increased the kilograms of beef produced per hectare, but the average individual weight performance of animals in the trial group dropped below the average of the control group."

Tim said the major disadvantages of the time-based rotational grazing model tested in the PIRD trial were that it was more labour intensive and required good stock water planning.

The effort in using the cheap single wire electric fencing added an extra hour into Tim's working week.

### Water

The PIRD trial paddock used a central dam but Tim said a more permanent rotational grazing system would require water troughs.

"I would say that water would be the biggest expense of using rotational grazing on the island," he said.

"But after the initial set-up costs for water and fencing, there are no

### Producer information

#### Producer group:

Kangaroo Island Beef Group  
(12 active members)

**Location:** Kangaroo Island, SA

**Property area:** 600–800ha

#### Enterprises:

Beef, mixed beef and sheep, or mixed beef and cropping

#### Goal:

To find ways to maximise productivity for members

#### Livestock

Various herd sizes amongst beef group members, ranging from 30 to 300 head

#### Pastures:

Ryegrass and sub clover with some improved perennials

#### Soil types:

Vary from sandy loams to non-wetting sands to highly acidic light sands

**Annual rainfall:** 450–900mm

extra expenses because stock are treated exactly the same as your traditional herd."

Tim said some supplementary feeding was required for the cattle in the trial paddocks, especially at the end of summer, but that was to be expected given the doubling of stocking rate.

### More information

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- Visit [www.mla.com.au](http://www.mla.com.au) for Tips & Tools and More Beef from Pastures program information.
- *MLA's More Beef from Pastures – The producer's manual* including the Feed Demand Calculator is available for \$65 to MLA members or \$10 for CD. Order the manual or CD online from [www.mla.com.au/publications](http://www.mla.com.au/publications)