Improving feed utilisation

PRODUCER SUCCESS STORIES

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Acknowledgements

In recent years, the farmers of Australia have been struggling with a wide range of challenges, underpinned by difficult seasons and widespread low rainfall. Woolworths and Landcare Australia have partnered with the Eyre Peninsula NRM Board to support the farmers of the Eyre Peninsula develop longer term strategies to address those challenges.

The EPNRM Board and Rural Solutions SA have delivered excellent results from this project. The case studies described in this publication are an example of the great achievements that can be delivered through partnerships between business, primary producers, regional bodies and government. These producer success stories will be a valuable resource for many mixed farming businesses around Australia.

Dr Shane Norrish
Landcare Australia Ltd

Eyre Peninsula has experienced three consecutive seasons of well below average rainfall. The "Support for profitable and sustainable farming systems on the Eyre Peninsula" project has provided short term and longer term benefits by demonstrating sustainable farming techniques in the region that suit local conditions. The short term benefits have included access to risk management strategies for producers to address the critical livestock feed gaps over the summer and autumn period, which also help to reduce erosion risk and top soil loss. The project has enabled producers to trial and develop a range of tools to use in their long term planning to create more sustainable farming systems. It has also created effective linkages between industry sectors, including Meat and Livestock Australia and Australian Wool Innovations Limited.

Brian Foster
Presiding Member
Eyre Peninsula Natural Resources Management Board

Mark Stanley, Deputy General Manager EPNRM Board and Shane Norrish, Landcare Australia.

Project Funders

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Woolworths

Landcare Australia

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Farmer Cooperation

Thank you to the farmers involved in the project for providing their properties for demonstration sites and sharing their stories.

Project Delivery

Rural Solutions SA

The project commenced in March 2008 and was complete in March 2009.

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Foreword

There is huge potential to improve the profitability of livestock enterprises through improved grazing management while maintaining and enhancing the soil resource that these enterprises rely upon. Past estimates show that only 20-30% of feed grown is actually eaten by stock but 40 to 50% use of paddock feed is considered sustainable. This project has demonstrated that gains can be made by making better use of paddock feed. Sub dividing paddock using flexible fencing systems enables more even grazing across all paddocks and within paddocks and helps prevent the "baring out" of areas favoured by livestock.

By having more control over grazing, producers can increase pasture utilisation, improve the quality of feed, increase pasture production and protect the soil from erosion. Profitability may then be improved by increasing the kilograms of meat or wool produced per hectare or by reducing the amount of supplementary feeding required. Increasing the amount of feed utilised is the most efficient way of lifting the productivity of a livestock enterprise.

The "Support for profitable and sustainable farming systems" project has been made possible with co-investment from the Woolworths Drought fund and the Australian Government. This investment has enabled twenty Eyre Peninsula producers to trial the implementation of some practical changes to improve grazing management. This has included the implementation of strategies to improve utilisation of both dry and green feed whilst maintaining soil cover. Many hundreds more farmers benefitted by gaining an understanding of the technologies being demonstrated through field days, newspaper articles and radio interviews. The key focus included; paddock size, temporary electric fencing, rotational grazing, mob size, stocking rate and pressure per hectare, and water location and supply.

The demonstration sites have shown that there are many ways to improve feed utilization while protecting the soil. These opportunities, and the experiences of producers involved in the project, have been captured in the case studies presented in this publication. Producers may be able to implement some of the ideas and principles into their systems to improve grazing management and make best use of pasture grown. It is important to have a low cost and simple grazing system. You can start by assessing your current system, keeping grazing paddock records and challenging yourself to improve.

The project was delivered by a team from the EPNRM Board and Rural Solutions SA, led by Daniel Schuppan, livestock consultant with Rural Solutions SA.

John Flavell, producer from Cleve, and Daniel Schuppan, Rural Solutions SA erecting electric fencing on John's property.

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Grain yield a bonus after grazing cereal crop

PROPERTY INFORMATION

Producers: John and Theresa Flavell

Location: Gum Flat, Cleve

Property Area: 1,212ha

Enterprise: 900 ewes joined to Merinos

Annual Rainfall: 400mm

With a focus on utilising all arable land and feed each season, John Flavell was keen to trial temporary electric fencing to control graze a green barley crop during winter.

In the past John has grazed oats however, they required spraying out in spring to control grassy weeds in preparation for the next year's cropping program. Oats were replaced with barley as the grazing cereal on his farm because it is a cleaner crop as residual chemicals can be used.

The challenge for John was to minimise the preferential grazing habits of sheep resulting in some sections of the paddock being grazed harder than others and under-utilisation of the total feed available.

Maximise feed available

In 2008, John subdivided a 65ha Keel Barley paddock into smaller cells as the stock required feed. By the end of the season three cells of 8, 20 and 6ha were grazed with the remaining 31ha un-grazed, even though the whole paddock was sown with the intention of grazing.

The barley was lightly sown at a rate of 35kg/ha, with 90kg/ha of single super in early May, on country that had yielded a 1.0 tonne/ha wheat crop in 2007 and grown vetch in 2006. Treflan at 1.3L plus Diuron was also used.

A Rappa™ machine was used to rollout a three-wire fence, taking approximately three hours to erect each 700m length. The fence cost $1,600/km for wire and posts plus $1,200 for a solar powered energiser.

In the past, stock were given free run of the whole paddock when grazing cereals. By using temporary electric fencing to graze the paddock in sections, John was able to reduce the selective grazing habits of stock by increasing grazing pressure, resulting in greater feed utilisation.

Grazing the crop

Four hundred 10 month old Merino lambs were introduced onto the 8ha cell of the green crop for its first grazing in July. The young barley plants were sufficiently anchored to resist being pulled out.

The water trough in this cell was turned off and this showed that the sheep obtained enough water from the green cereal. This gave John the confidence to put stock in the other cells, where there was no access to water while the crop was green.

John Flavell and his solar energiser system.

John Flavell picking up electric fencing using Rappa™ system.

The paddock was irregular in shape with clumps of scrub and rock. John experienced a few lambs breaking through the fence each day for the first two weeks and recommends fence lines should be checked daily, at least until sheep respect them.

By grazing the barley hard and then moving the fence and stock onto fresh crop, the paddock was able to provide 12 days grazing over the first 8ha, 18 days over the next 20ha, 13 days over 6ha and another 28 days over the first 8ha section. This 8ha was then let go to head but not harvested. Pasture used is summarized in table 1.

Grain bonus

Grazing was ceased in mid-September, allowing the barley to run to head. Of the 65ha, 48ha was harvested, which yielded a bonus 85 tonnes of Feed Grade 3 grain. The areas of the paddock which had not been grazed during winter yielded the same as those which had.

There was still grain in the heads of the 17ha that was not harvested due to the barley being too low as it had not recovered from grazing. After harvest three hundred 5 month old lambs were taken from 40 to 55kg live weight on the whole paddock (stubble and standing crop) for 45 days in December 08 and January 09.

Future activity

John was impressed by the results from cell grazing and intends purchasing his own Rappa™ machine. This will enable him to better utilise green crops, lucerne, standing cereals and cereal stubbles depending on how each season develops.

He intends to start grazing cereals earlier in the growing season, as soon as plants can resist being pulled out by stock and are carrying sufficient leaf.

Section	Stocking pressure DSE/ha	Stocking rate (12 mth period) DSE/ha	Grazing days	Pasture used KgDM/ha
8ha	64	7.6	43	2767
20ha	29	1.4	18	527
6ha	86	3.1	13	1121
65ha standing stubble	8	0.5	47	564

Table 1: Grazing summary

Rotational grazing provides more feed

PROPERTY INFORMATION

Producers: Chris and Leanne Lymn

Location: Wudinna

Property Area: 3,000ha

Enterprise: 1,100 ewes joined to Merino and terminal sires

Annual Rainfall: 300mm

With the implementation of a more flexible, high intensity, rotational grazing system on his property, Chris Lymn has been able to improve feed utilisation and produce more feed.

Rotational grazing

Portable electric fencing was used to graze a 93ha paddock in approximately 12ha cells. The paddock was dry sown to Tahara triticale in late April 2008. At the start of the season when there was little dry matter available, the mob was shifted every 2-3 days and this extended out to 2-3 weeks in spring.

Chris used two live wires, an earth, and tread-ins to erect 800m fence lines. The fence was shifted down the paddock, when needed, to provide his sheep access to the next 12ha of fresh feed. He used a front and back fence to give stock access to a limited area of fresh feed and to stop sheep having access to the area previously grazed. A modified sack truck was used to pick up the wires.

The fence energiser was positioned at the centre of the 800m runs, with the tread-ins spaced 30m apart. Chris had initially set them at 10m, but found only one sheep had bothered to push through the fence. He believes the key is to have a 3 joule energiser, a good earth, and good connections then the sheep will respect the fence. It took approximately 2 hours to put up an 800m section of fence.

Grazing management

220 lambing ewes were given first access and grazed the first 12ha cell in late June. Feed test results showed the crop was providing 24% crude protein and 12.6MJ digestible energy/kg dry matter. While grazing the green crop no water was required by the ewes and lambs.

Chris found the most difficult aspect of managing this new grazing system was determining when he needed to move his stock forward onto the next cell to be grazed. As a practical indicator, he provided continual access to a 400kg round bale of oaten hay and observed their grazing behaviours. As soon as he saw his ewes taking renewed interest in the hay, they were moved. This generally occurred when the crop was grazed down to around 5 to 10cm high. The crop recovered very well after grazing.

His 220 ewes produced 241 lambs. Mismothering was a problem when shifting lambing ewes. To overcome this, Chris left freshly lambed ewes behind for an extra week when the remainder of the mob were moved forward.

Chris Lymn in his triticale paddock set up with a portable solar energiser and electric fencing.

Benefits from intensive grazing

A 20ha section of the total 93ha paddock was not required for grazing and was reapt. The yield was a bonus 16.6 tonne of grain. In addition, baling the straw behind the header yielded 55 bales (16.5 tonne), which became a roughage source to be used when confinement feeding later in the season.

Next time Chris would treat the 20ha not grazed as a crop and spray out the weeds during the season. This area was a sandy rise in the paddock. The risk of sheep camping and grazing the area was eliminated by using the temporary fence and in the end it was not grazed at all so stubble remained on the sand hill.

By intensively grazing the 73ha, Chris was able to extract 119 grazing days from the system. This meant that he did not have to reduce his sheep numbers, which looked like being an option given the seasonal conditions and lack of other paddock feed.

By grazing smaller areas and having a higher stocking pressure (55 DSE/ha) selective grazing was reduced and feed utilisation was improved. One tonne of dry matter per hectare being used.

Rotationally grazing the cells also allowed plants time to recover after grazing which contributed to more feed being grown.

To compare systems, another 100ha paddock on his property was not divided and provided 28 less grazing days for 220 ewes and lambs. Only 535kg of DM was utilised per hectare and there was no bonus grain yield.

Chris intends utilising more temporary electric fencing in future seasons. This will compliment an expansion in the use of medic pastures across his farm. He will lock up sections of paddocks to allow the medics to fully set seed.

Next year he is also considering pregnancy scanning his mated ewes and then splitting them into separate single and twin lambing groups. Extra feed will be allocated to those ewes carrying twins in smaller paddocks.

Triticale grazed hard and then allowed to recover by removing stock.

Sack truck used to pick up wires.

PRODUCER CASE STUDY

Temporary fencing extends cereal grazing options

PROPERTY INFORMATION

Producers: Damien and Eileen Lynch

Location: Poochera

Property Area: 8,080ha

Enterprise: 1,000 ewes joined to Dohnes

Annual Rainfall: 300mm

Temporary electric fencing has increased paddock flexibility on Damien Lynch's property at Poochera.

After purchasing two neighbouring properties, Damien has recently implemented a fencing program to create paddocks based on their historical crop yield.

Around 800ha of less productive cropping ground has been allocated for the sheep enterprise and in the process, more productive cropping paddocks have been created.

Damien had always used permanent fencing for this purpose but with capital costs increasing and the management of these smaller grazing sections beginning to create problems with frequent stock movements, he decided to investigate the suitability of temporary electric fencing.

Electric fencing was an attractive option for Damien, particularly if it allowed paddocks to be quickly divided and stock to be moved regularly on to fresh feed without having to be shifted over long distances. While he had no prior experience with electric fencing the project provided a great opportunity to give it a trial run.

Paddock subdivision

He first used electric fencing in November 2008 to graze 50ha of standing barley and oats (un reapt). The paddock was grazed in 6 blocks of approximately 8-9ha each, with stock being moved onto new feed every eight to ten days.

A single 3 line fence was erected and was shifted 5 times creating the six grazing sections. No back fence was used to stop lambs from re-grazing the previously grazed area. However, water was shifted with the stock and the lambs stayed on the fresh standing crop.

Following 75mm of rain a green pick emerged in the grazed sections. In this situation a back fence is required to prevent lambs from chasing the green pick.

The total area provided 47 days of grazing for 360 crossbred lambs with a stocking pressure of 60DSE/ha.

Damien and Eileen Lynch

Trailer mounted Rappa™ system manufactured by Lynchez Hydraulics and Welding - Poochera.

The fence consisted of 1km long runs of two electric wires and one earth wire, supported by steel "tread-ins" spaced 15m apart. The fence was later changed to only two electric wires and no earth wire with no problems.

Stock water was provided in a 600 litre poly dish trough, which required cleaning out every 2 to 3 days.

Crop recovery

A second 105ha paddock of standing barley crop was cell grazed using electric fencing in January 2009. This paddock had been grazed green (under set stocking) for 14 days in July with 300 ewes. The stock were moved off the paddock due to the risk of soil erosion. At the time Damien believed the crop would not recover, because of the dry season.

This paddock was not grazed as evenly as the 50ha paddock as the water supply could not be shifted. This resulted in the lambs having to walk further to water and baring out the soil around the water point.

Fencing rollout

Damien did not have a 4 wheel motor bike so has built a two-wheeled trailer to assist with the rollout and shifting of fence lines. It takes two people about one hour to take down and re-erect a 600-700m length, with all the equipment required now fitted onto his vehicle-towed fencing cart. Damien is very happy with the Rappa™ system and even made his own reels to reduce the costs. However the reels can only fit 400m of braided wire, this so is a real disadvantage with big paddocks.

Feed utilisation

By using the temporary electric fencing, Damien is now aware of how much feed has been wasted in previous years through stock trampling and selective grazing in bigger paddocks. His sheep now graze to within 1m of the fence lines and, provided there is adequate feed retained within the paddock, they do not put pressure on the electric fence.

However, kangaroos and emus can occasionally flatten fences as two wires can be difficult for them to see.

Based on his past 12 months experience with using these temporary fences, Damien now intends increasing his breeding ewe numbers from 900 to around 1200. He is confident in the fact that his property will now provide sufficient feed to be able to carry that number throughout the year.

Using temporary electric fencing to graze cereals provides management flexibility depending on the season and allows maximum grazing days to be achieved. Cereals can either be grazed green and then harvested, cut for hay or grazed as a standing crop.

Solar energiser system in standing barley crop.

High intensity grazing produces quality lamb

PROPERTY INFORMATION

Producers: Craig and Jo Skinner

Location: Cockaleechie

Property Area: 2,400ha

Enterprise: 1,300 ewes joined to terminal sires and 80 breeding cattle

Annual Rainfall: 425mm

Craig Skinner identified from attending a Prograze course that he had the potential to increase stocking rates if he could develop a more intensive approach to grazing on his property.

Rotational grazing system

On May 3, 18ha was planted to Sungrazer Italian ryegrass at 25cm row spacings, along with 80kg/ha of DAP. An additional 60kg of urea per hectare was applied during the season. This was applied to a cell after each grazing to avoid possibility of nitrate poisoning.

In early June 2008 he subdivided the 18ha paddock into four smaller 4.5ha cells to allow for rotational grazing. A Rappa™ machine mounted on his quad bike was used to roll out a three wire temporary electric fence. Later a two wire and then a single wire fence was used. The Rappa™ machine worked very successfully and reduced time required for erecting and dismantling the fence.

The first cell was stocked on June 30th with 200 lambing ewes. There was 1,200kg of dry matter on offer when the ewes went in. The sheep rotationally grazed the 18ha from 30th June until 27th November at which time the lambs averaged 42kg live weight and the ewes were in condition score 3.5 to 4.

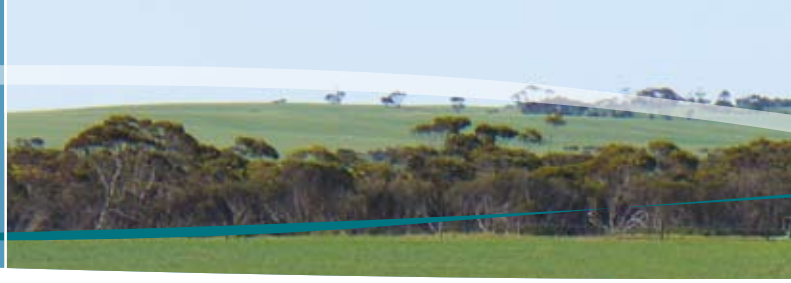
The paddock winter stocking rate was 33DSE/ha with a stocking pressure of 133DSE/ha within individual cells. Grazing records estimate 5000kg of dry matter was utilised per hectare.

Sheep grazed each cell for 5 -14 days depending on how much feed remained in the cell and how much was in the next cell. The aim was to keep the grass in phase two growth (between approximately 800 and 2500kg DM/ha). In the last month the sheep had the run of the whole paddock.

No sheep went through the electric fence and the single wire worked as well as three. The only problem was getting the sheep past the wires to move them into the next cell.

A portable water tank with trough was moved between cells with each stock rotation, but was not heavily used until the pasture dried out.

Two wire and one wire electric fence.



Pasture in each cell at different growth stages due to rotational grazing.

Portable water system.

Benefits of temporary fencing

Although the last significant rains were received in September, Craig had sufficient feed remaining within the cells to maintain stock numbers on the area until summer stubble grazing became available. This was something he believes would never have been achieved if his stock had been left to selectively graze over the original larger paddock. There would have been more wastage from trampling and pastures would not have been kept in growth phase two.

Craig Skinner

Prior to the fence being erected stock had access to the whole paddock. They were only grazing a very small area of the paddock out from some trees where they camped. Dividing the paddocks into cells forced them to graze each cell resulting in the whole paddock being grazed evenly.

The flexibility of electric fencing has also proved to be useful in other grazing situations. With much of the permanent fencing on Craig's property at Wanilla being destroyed during the 2005 Eyre Peninsula bushfires, Craig has been cropping his farm to land class without fences in recent years. This summer, he erected a 2 live/1 earth wire temporary electric fence to separate crossbred lambs on lupin stubbles from adjoining ewes on cereal stubbles.

There is also the opportunity to use electric fencing on stubbles to restrict animal access to erosion prone areas.

This year, he intends taking 100ha of less viable cropping land out of cropping and sowing it down to Italian ryegrass and Wintaroo oats at 15cm or 20cm row spacings. A Rappa™ machine and electric fencing will be used to provide smaller areas for intensive winter grazing.

Maximising winter stocking rate is the key at Kapinnie

PROPERTY INFORMATION

Producers: Justin and Samantha Pedler

Location: Kapinnie

Property Area: 1,414ha

Enterprise: 1,000 ewes joined to terminal sires

Annual Rainfall: 450mm

Sheep play an important part in Justin's farm management plan but when the family farm is 95% cropped there is not much room for stock during winter. Sheep have been very profitable for Justin over the last 3 years and he is continuing to look at ways to increase winter stocking rates.

In 2007 Justin grazed a 60ha paddock of barley sown for winter feed with Merino ewes and crossbred lambs. However, the grazing value from the paddock was not maximised as the sheep grazed the area too selectively. They stayed on the short plants too long and left about 30% of the paddock un-grazed to eventually go to head.

This experience, coupled with participation in a Prograze course, encouraged Justin to develop a rotational grazing system the following season to extract maximum feed utilisation from his grazed country.

Rotational grazing

In 2008 he subdivided a 50ha paddock into three smaller paddocks of 20, 14 and 16ha. He used runs of 700-900m 2 wire (both live) temporary electric fence.

All cells were sown in early May to Keel barley at a rate of 120kg/ha, along with 60kg/ha of 18:20 fertiliser. In addition, two of the cells received a 60kg/ha urea in late July. The paddock is a poor performing crop paddock and has an annual ryegrass problem.

Justin's grazing strategy was to graze each cell for a period of five days, and then to shift the sheep onto the next cell, before returning to re-graze 10-12 days later. No stock water was provided until late October.

His experience with this type of electric fencing was that sheep (mainly the lambs) take about two weeks to learn to fully respect the fence, after which time they would graze to within 20cm of it.

Jack and Justin Pedler.

Even grazing due to high stocking pressure.

Each fence was erected at the start of the season and left in place for the growing season. After each graze Justin would walk along and shift the fence onto the freshly grazed area to stop the barley touching the fence. Justin preferred this rather than spraying under the fence which could cause erosion in the sandy soils. Winding up the fence after use was a two-man job and took about two hours per 700-900m length.

The cell grazing prevented sheep from creating favoured camp spots and baring-out the sandier rises. It gave a more even grazing across the paddock and enabled Justin to maintain his sheep numbers during the growing season.

Monitoring

To monitor the sheep enterprise performance Justin has kept grazing records over the past three years. In 2008 the winter stocking rate was 16DSE/ha with stocking pressures of up to 70DSE/ha. The records showed that 3,300kg of dry matter was utilised in the 50ha keel barley paddock while in a paddock of Italian ryegrass 4,300kg of dry matter was utilised.

Justin planned to repeat the program in 2009, with his sheep rotationally grazed in cells during winter before having access to crop stubbles in summer.

Solar energiser unit and reel stand.

Innovative thinking makes using electric fencing easy

PROPERTY INFORMATION

Producer: John Oswald

Location: Yaninee

Property Area: 3,636ha

Enterprise: 1,200 ewes joined to Merino and terminal sires

Annual Rainfall: 275mm

Solar energiser mounted on an old windmill stand.

Temporary electric fencing has been used successfully by John Oswald at Yaninee to subdivide large paddocks and intensively graze green cereal crops.

With paddocks currently being worked up and back, some permanent fencing on the property has been removed and will not be replaced. In addition, leased country was never going to be permanently fenced.

The large paddocks and minimal permanent fencing is suitable for the cropping system, however the same does not apply for the livestock system. This is where temporary fencing has become a viable option to enable paddocks to be divided and cereal crops to be heavily grazed.

John Oswald with his home-made reels and steel post.

Trialling electric fencing

A 60ha barley crop was sown in late April 2007 and subdivided from a larger area. It was first grazed with 230 ewe hoggets for four weeks from the first of July to allow the medic pastures to grow ahead of the sheep. It was then allowed to recover, reapt in November and the stubble grazed in December.

The 1.2km dividing fence consisted of two live wires plus an earth, steel droppers along stonier sections and tread-ins in sandier parts. It was powered by a 3 joule energiser unit positioned half way along its length.

Another 202ha paddock was subdivide into 3 paddocks and grazed by two different mobs. This fence was 2km of 2-live wires with tread-ins spaced at 20-30m apart. An earth wire was not used as the soil carried sufficient moisture to provide the necessary relay back to the energiser unit. A good earthing system is essential for the system to work successfully.

John did not experience any problems with sheep walking over either the 2 or 3 wire fences.

To enable larger wire reels to be used and to avoid joining wires, John now makes up his own wire storage reels. He joins two recycled mig welding wire reels together and winds on his braided electric wire using a power drill fitted with a purpose made adaptor.

John has also designed a jig that sits on the back of the ute so the reels can be attached for ease of rolling out.

Another gadget has been developed for rolling the wires up.

John uses 13mm diameter galvanised windmill rod, cut to length and fitted with multi-fit post insulators, in place of tread-ins. This has allowed John to run electric

fencing over his rockier ground. The steel rod can be hammered into cracks in the limestone easier than steel tread-ins which break. They are also better than steel posts which are harder to hit into the rock.

Depending on the type of pasture present, John recommends a regular fence line herbicide application to prevent growth coming into contact with bottom wires and shortening out the fence.

Looking forward, he has recently purchased a neighbouring property and intends using electric fencing to selectively fence off sections in larger paddocks. This will keep sheep off sand hills and increase grazing pressure and feed recovery.

Device made for reeling up braided wire. One reel can be wound up at a time due to a locking mechanism.

Electric fencing lifts grazing pressure at Penong

PROPERTY INFORMATION

Producers: Ben and Andrea Polkinghorne

Location: Penong

Property Area: 9,292ha

Enterprise: 3,000 Dorper ewes

Annual Rainfall: 325mm

Ben Polkinghorne wanted to get more out of his pastures. He used temporary electric fencing to reduce the size of his paddocks and increase grazing pressure, with positive results.

His average paddock size of 400-600ha was too large for mob sizes of between 300-400 head. Consequently grazing pressure was low, resulting in uneven grazing and poor feed utilisation.

3 wire electric fence across oats.

Ward's weed was a problem on the property and a higher grazing pressure was needed to control the weed while it was young and plants were still short, green and attractive to sheep.

Increase pressure with electric fencing

Grazing pressure was increased in a 365ha standing oat crop by dividing the paddock into half with electric fencing. A Rappa™ machine was used to rollout 2-3km of 3-live wire temporary fence. Ben settled on using tread-ins spaced at 20m after first trialling 30, 20 and 15m combinations to prevent lambs from jumping over and strong prevailing winds from flattening it on sandier soils.

The paddock was grazed in sections by 500 lambs and the electric fence worked extremely well. There were no problems with stock getting through. Ben could shift up to 3km of fence in a day and the Rappa system made the process quicker.

A small portable poly stock trough was used as a temporary watering point which was filled using a 4,000 litre water cart. Ben found this arrangement resulted in fewer lambs climbing into the trough and therefore less labour required for cleaning out.

Ben intends to divide further paddocks this season, to make greater use of cell grazing of standing cereal crops and to put pressure on Ward's weed.

Paddock subdivision improves grazing of lucerne

PROPERTY INFORMATION

Producers: Bert and Barb Woolford and Toby Cousins

Location: 20km South of Kimba

Property Area: 1,212ha

Enterprise: 1,200 ewes joined to Merino rams, turn off 500 wether lambs at 20kg+

Annual Rainfall: 330mm

Toby Cousins and Bert Woolford at a water riser trough site.

Electric fencing has been used with great success on Bert Woolford's property to intensify the grazing of lucerne and increase utilisation of the total feed available.

Aurora lucerne was first seeded over 160ha of deep sands in July 2007 as an alternative to growing lupins, to help with summer weed control (mainly skeleton weed and melons) and to recover subsoil moisture.

The first grazing occurred in February 2008. Sheep were provided access to the whole paddock which resulted in selective and uneven grazing.

Temporary electric fencing was trialled to enable strip grazing of lucerne, but the concept was temporarily abandoned because the fence could not hold in the prime lambs.

In October 2008 Bert and Tony revisited the issue of feed under-utilisation across the farm and decided to use paddock subdivision and electric fencing as a combined strategy to recover maximum grazing from their lucerne stands.

Paddock subdivision

A 106ha paddock was divided into four 26ha strips and another 54ha paddock divided in half, creating six smaller paddocks.

The 106ha paddock was split down the middle using a permanent, 3-wire electric fence with posts spaced at 40m and three poly spaces between posts to keep wires off the ground and provide a visual barrier. From the permanent electric fences further temporary electric fencing, consisting of braided wire and steel tread-ins, were run out to reduce paddock size further. The 54ha paddock was also subdivided using temporary electric fencing.

Bert says it is necessary to make fences highly visible to reduce the incidence of kangaroos breaking through it.

After the first unsuccessful trial of electric fencing, Bert found out that the energiser he had used lacked the required "punch" to confine crossbred lambs. For the second time round the energiser was upgraded to a 3 joules energiser powered by solar and has resulted in no problems with lambs getting out.

They realised the importance of setting electric fencing up correctly for it to be successful and recommend the regular use of a volt tester to ensure fences are working.

2 wire temporary electric fence.

Livestock water system

Poly water risers have been installed off a permanent water line which runs the length of the 106ha section and a poly trough is moved from paddock to paddock where needed. A temporary 10m line from the riser to the trough allows it to be shifted onto new ground with each move, thereby reducing potential for erosion occurring around the watering point.

Grazing strategy

Bert's grazing strategy has been to heavily graze the 26ha sections with 500 to 1,000 Merino lambs over a 2-3 week period, followed by adult sheep. The cells are repeat grazed 4-5 weeks later.

Improved pasture utilisation

Changes in fencing and paddock re-sizing has resulted in greater utilisation of the lucerne. It is now carrying as many sheep as the whole farm, before the changes were made! It has reduced hand feeding in autumn and utilises out of growing season rainfall.

Winter cleaning and windrowing of weed turnip is carried out to clean up the lucerne. Windrowing the turnip evened up the paddock and improved grazing as the sheep don't like walking through the standing turnip.

3 wire permanent electric fence.

In January 2009, 50ha was shut up to harvest for seed, since the more efficient grazing management meant the area was not being required as a feed reserve in summer. It yielded 50kg/ha and was then grazed 3 weeks later.

Paddock inspections have also shown the established lucerne plants provided an additional bonus in summer by robbing young melon seedlings of soil moisture, leaving them dehydrated and shrivelled.

Following the success of this project during the last two drought years, Bert is planning to sow an additional 150ha of lucerne in 2009.

Solar energiser system.

New approach to fencing is efficient for sheep and cattle and keeps costs down

PROPERTY INFORMATION

Producers: Mark and Karen Dennis

Location: Koppio

Property Area: 1,600ha

Enterprise: 1,400 Merino ewes joined to Merino and terminal sires, 900 wethers and 30 breeding cows.

Annual Rainfall: 540mm

Mark Dennis standing next to his newly erected 4 wire electric fence.

Fencing to land capability has enabled Mark Dennis to increase productivity on areas of his property that are prone to water logging.

Prior to and now since the 2005 Eyre Peninsula bushfires went across parts of his property, Mark has implemented an ongoing fencing program to gradually section off areas of his farm prone to water logging.

These areas are too wet for cropping and have resulted in variable grain yields. By dedicating these areas to livestock production, productivity can be lifted.

Traditionally, permanent fence lines have been installed using timber posts at 10m spacings, cyclone and both a top plain and barb wire. This approach is both time consuming and expensive and Mark was keen to explore cheaper alternatives.

Electric fencing was used on the property over 25 years ago when it supported a dairy enterprise, and temporary electric tapes have been used for cattle and sheep since the fire to control and maximise grazing of his Italian ryegrass pastures as well as in lupin stubbles. However, Mark had never used permanent electric fences for grazing sheep.

Electric fencing an alternative

As a trial, Mark erected 1.5km of permanent electric fencing in 2008 between an area of pasture and canola crop. The pasture was grazed by cattle in mid-August and again by lambs in mid-September.

The fence was erected using timber end strainer posts with no struts or end esembles with 500m strains. Galvanised droppers at 30m spacings and ploy spacers every 15m were used with three plain wires plus a top barb. The bottom and third wires were electrified.

The bottom wire sits 300mm above ground height and the top barb wire at 1050mm. In Mark's opinion, the top barb adds the extra height needed to act as a deterrent to cattle when the fence is not switched on.

He has experienced no problems with cattle or prime lambs wanting to push through this design of fencing and they graze right up to it.

Fencing off waterlogged sections of cropping land, allows it to be used more productively for grazing livestock. The permanent electric fencing also provides greater flexibility and a more cost efficient system compared with the traditional cyclone fence.

This first 1.5km of electric fencing is the first stage of a bigger farm plan to erect 10-15km of electric fencing around waterlogged sections.

Supplying fresh water quickly is the key for grazing cattle at Wanilla

PROPERTY INFORMATION

Producers: Ron and Maureen Gerschwitz

Location: Washpool at Wanilla

Property Area: 630ha

Enterprise: 70 breeding cattle

Annual Rainfall: 500mm

Maureen and Ron Gerschwitz

When Ron Gerschwitz chose to reduce the size of his cropping program and increase breeding cow numbers, he needed to extract maximum grazing from the paddock feed available. This was achieved through the repositioning of watering points and paddock subdivision.

Old watering points on Ron's property were positioned in the corners of the paddock. This resulted in his cattle camping around water troughs for too long, leaving feed untouched at the top ends of paddocks, or walking off too much condition between feeding and watering.

Paddock subdivision

Ron used permanent electric fencing consisting of treated pine posts at 20-60m spaces and steel droppers at 20m, to divide a 85ha paddock into half.

Changing the watering point

A new watering point was extended half way down the paddock which also provides water for the newly subdivided paddock. Water comes from a 9,000 litre tank located at the top corner of the paddock. The pipeline is 40mm ID Rural B'Class and this flows into a 3.6m long concrete trough through a 40mm diameter low pressure inlet.

The benefits

Subdivision of paddocks and the additional water point now encourages his cattle to graze across the whole paddock.

Ron has observed that his cattle now spend more time grazing across the paddock and less time camping around water.

He has now embarked on a program of adding a header tank to every stock trough on his property, and using 40mm ID Rural B'Class pipe from tank to trough, to achieve good flow rates and minimise the time taken for his cattle to drink.

3 wire electric fence used for cattle.

Existing trough and tank setup. The tank is elevated 1m using an old galvanised tank filled with soil.

PRODUCER CASE STUDY

Getting the most out of grazing lucerne

PROPERTY INFORMATION

Producers: Grantley and Dale Telfer

Location: Stokes

Property Area: 1,212ha

Enterprise: 1,100 ewes joined to Merino and terminal sires

Annual Rainfall: 450mm

Grantley Telfer

Permanent and temporary electric fencing has been used by Grantley Telfer to improve grazing and to ensure he gets the most out of grazing lucerne.

Grantley uses lucerne as a reliable out-of-season feed source for finishing crossbred lambs following summer rains. It fills his farm's feed gap between spring and grain harvest before sheep have access to stubbles, as well as helping with ryegrass control and building soil nitrogen.

He decided to try rotationally grazing his lucerne to achieve a more even grazing. Under set stocking, the sheep preferentially grazed the higher parts of the paddock and only returned to the lower sections once the top had been eaten out.

Dividing the lucerne paddock

A 52ha paddock of SARDI 10 lucerne was sown in August 2007 under contract to eventually harvest a section for seed. The paddock was divided into four sections using temporary electric fencing. The fencing consisted of two live wires and steel tread-ins at 15m spacings.

One permanent electric fence was also constructed along a creek line using 4 wires, pine posts spaced at 40m and 3 red gum spaces between posts.

Electric fencing was used to section off a central soak which now has controlled access from four paddocks.

Grazing

270 ewes with 300 lambs at foot were given first access to the lucerne, as well as an adjoining 64ha pasture paddock, in early August 2008. This was the lucerne's first grazing since the season's opening rains.

A total of 42 days grazing was achieved across the total area, before the sheep were removed to allow the lucerne time to recover prior to setting seed.

Grantley was concerned that the lucerne plants were showing too much leaf-fall by late October due to moisture stress. So he removed the temporary fencing and gave his 650 ewes and 700 lambs full access over the whole lucerne stand, for an extra 14 days.

With the removal of the temporary fences the sheep's old grazing habits returned - with stock grazing and camping concentrated on the highest areas of the paddock. This highlighted the importance of grazing smaller areas, with high stocking density, for a more even grazing.

Take-home messages

Through participating in this project, Grantley formed some firm opinions on how best to manage sheep using temporary fencing.

He recommends using an earth wire, especially when soil moisture is lacking, to ensure the circuit is complete and the animal gets a shock.

The fence should be turned on when stock are first introduced into the paddock and be "live" at all times. Grantley left his fence turned off for two days, which gave his woolly ewes, and especially the lambs, the opportunity to disregard the fence and start pushing through it. This resulted in 15 to 20 "escapees" during the first week or two of its operation.

Feed should be assessed regularly to ensure the timely removal of stock. If stock are left to overgraze a section behind an electric fence, the pressure to find feed will cause some sheep to disregard the fence and jump. Regular pasture assessment allows you to work out the amount of grazing left for stock, or to identify the need to remove stock earlier than expected.

Grantley would consider using a training paddock enclosed by a 4-wire fence to educate sheep to electric fencing, before releasing then into paddocks serviced by 2-wire fence lines.

Plastic tread-in wire supports can be too flexible when buried in some soil types. Insulated steel droppers may provide a more rigid alternative, reducing the tendency for sheep to jump when seeking fresh feed.

In the future, when the lucerne stand thins out, Grantley intends sowing barley, then grazing the paddock as a green crop, using temporary fencing, before closing it up for harvesting.

Permanent electric fencing

Temporary electric fencing

Central watering point cuts down stock travel

PROPERTY INFORMATION

Producers: Frank and Tracy Kenny

Location: Elliston

Property Area: 2,626ha

Enterprise: 2,000 self replacing Merino flock and 1,000 wethers

Annual Rainfall: 400mm

40mm float valve provides high flow rate.

Feed wastage due to paddock size and the long distances stock had to travel for water was an issue on Frank and Tracy Kenny's property at Elliston. However, feed utilisation has been improved following the addition of a central watering point.

A single 650ha paddock had never been fully grazed, as sheep had to travel up to 6km from one end back to a single watering point at the other end. The trough is currently located at the southern end of the paddock and the sheep tend to graze into the southerly winds.

This results in overgrazing of the southern end of the paddock while leaving feed in other areas of the paddock virtually untouched.

Manipulating grazing habits using watering points

In September 2007, Frank decided to change his sheep's grazing habits by installing an additional watering point in the centre of the paddock. A 5,000 litre poly header tank was used to supply water to a new 2.4m long concrete trough.

Frank was also keen to see how a large mob watered from a small trough with high flow rates compared with the existing 9.6m long trough.

Frank with new 2.4m trough and header tank in the background.

A 3km run of 32mm ID rural B'class poly pipe was partially trenched-in and provides water to the tank. This then feeds into the trough through 40mm ID rural B'class poly to ensure a good flow rate into the trough and reduced mob watering times.

Water flows into the tank at a rate of 0.1L/sec, which provides about 8-9000 litres per day. The flow rate into the trough is 0.7L/sec, allowing a large mob to water quickly.

The total cost of water improvements was $4,500, which equates to $6.90 per hectare. To pay for the improvements in one year Frank would have to increase his stocking rate by 0.34DSE/ha from the current 1.08DSE/ha to 1.42DSE/ha.

Simple whole farm water system

Frank has one main bore on the property, which he uses to pump water 4km to a tank on a high point. From this tank he gravitates the water to other tanks and troughs on the property.

Effect on feed utilisation

The paddock was set stocked with 400 Merino wethers with both watering points made available for the stock. Normally 600 would be run but the number has been cut back due to the dry seasons.

While Frank is yet to turn off the original water point so the new central trough is their single drinking source, he has noticed the shorter distances to water has already had an impact on their grazing patterns. More feed is being utilised at the northern end of the paddock, where previously feed was left untouched.

The aim over the coming years is to gradually increase stocking rates which is a key profit driver. This will be achieved by further increasing feed utilisation through subdividing the paddock into 3 or 4 smaller paddocks and implementing a rotational grazing system. Until the fencing is complete Frank will be able to graze the paddock by water points just by having one point on at a time.

Current 9.6m trough in southern end of paddock.

Water flow rates the key when rotationally grazing large mobs

PROPERTY INFORMATION

Producers: Richard and Karen Dutschke

Location: Lock

Property Area: 1,414ha

Enterprise: 1,000 ewes joined to Merino and terminal sires

Annual Rainfall: 300mm

Richard Dutschke next to one of his troughs with a 50mm float valve.

Rotational grazing and delivering greater inflow rates to stock watering points on Richard Dutschke's property at Lock has improved grazing and reduced erosion around water troughs.

A simple winter grazing rotation

Richard has taken a 120ha paddock out of his annual cropping program and divided it into four 40ha sections. He used permanent electric fencing consisting of four wires and steel droppers. This has allowed him to implement a simple 4 paddock rotational grazing system on this area of the farm to improve feed utilisation of annual medic pastures. Richard likes to run his sheep in large mobs.

A new poly cup-and-saucer trough is also being trialled to replace the more traditional 3.6m long concrete trough in a newly built 4-way central yard.

This arrangement allows sheep to be watered from any of four smaller paddocks simply by opening up the appropriate gate.

Richard has a 8km 63mm Metric pipeline running through his property that feeds header tanks. As part of a whole farm plan, Richard is changing his trough inlet risers over from a commonly used 32mm diameter to 50mm, to increase flow rates to his 1,000 head mobs.

The increased water flow to watering points has allowed sheep to consume their daily requirements quicker, and then return to grazing, without baring out areas around water troughs.

Concrete apron around trough to stop erosion.

Grazing more than doubled through management

PROPERTY INFORMATION

Producers: Ed and Carolyn Hunt

Location: Wharminda

Property Area: 2,000ha

Enterprise: 580 ewes joined to SAMMs

Annual Rainfall: 232mm

Ed Hunt

A combination of poor seasons, varying soil types, and degraded paddocks convinced Ed Hunt to trial temporary electric fencing on his property, with great success.

Large paddocks on the property made it difficult to manage changing soil types within paddocks when grazing, and led to overgrazing of sandhills and excessive erosion around permanent water troughs. Ed also had to contend with an increasing incidence of non-wetting sands under a no-till cropping program.

In the past Ed had been reluctant to permanently fence off areas in paddocks prone to overgrazing and drifting. This was due to high capital costs and difficulties created in working a cropping program around smaller paddocks.

However, after three consecutive drought years that left little ground cover over his lighter country and with the heavier soils powdering, the grazing value of any stubbles they contained was reduced. Ed knew he had to make a change.

In September 2008, Ed trialled the use of temporary electric fencing for grazing in one of his paddocks. He wanted to extend the grazing life of one paddock without the high costs and difficulties of permanent fencing.

Fencing

In a 45ha paddock containing self-generated medic pasture and turnip weed, the risk of erosion on a sandhill from overgrazing was great. To reduce the risk a temporary electric fence was erected around the sandhill.

The fence consisted of three braided wires supported by steel tread-ins at 15m spaces and an insulated star dropper every 200m. In hindsight, Ed would recommend using more steel droppers than tread-ins when fencing on sandhills because the fence was prone to lay over in strong winds.

Grazing benefits

190 hoggets grazed the paddock at a stocking rate of 6DSE/ha from mid-August through until mid-October.

Grazing of the whole paddock started on the 15th of August and under normal management practice would have ceased around 8th of September once the sandhill was at risk of erosion, providing a total of 24 days grazing. The fence was shifted down the sandhill twice and gradually removed the sandhill from the paddock. This enabled the sheep to remain in the paddock until the 12th of October providing an extra 34 days grazing. This increased feed utilisation for the whole paddock from 150kg DM/ha to 370kg of DM/ha.

To reduce the potential for erosion caused by sheep camping around waters, T-connections are being put into the main water lines so a temporary trough can be shifted along the pipeline in the paddock to create multiple watering points. There is also a water tanker available on the property to cart water to temporary troughs as a last resort, in case of line breakages or if more paddocks are temporarily divided in future to intensify grazing.

Having seen the benefits a more intensified approach to grazing can deliver, even in a drought year, Ed is keen to expand his use of temporary electric fencing in the coming season.

Paddock subdivision improves feed utilisation

PROPERTY INFORMATION

Producers: Kym and Kylie Villis

Location: Heggaton District

Property Area: 1,616ha

Enterprise: 1,100 Merino ewes mated to terminal sires

Annual Rainfall: 400mm

Permanently fencing off scrub and subdividing the remaining paddock into smaller paddocks has given Kym Villis greater control over his grazing program.

Soil type varies across the paddock from clay loam to deep sands. This causes huge volumes of feed to be present on the heavier patches while drifting occurs over the sandier areas through selective grazing.

The paddock size and distance from the watering point to the far end of the paddock also results in uneven grazing, with feed furthest from the watering point becoming rank.

During spring, extra stock numbers would traditionally be brought in to try and utilise the flush of feed available. But the bigger mobs resulted in further feed losses through stock trampling.

Paddock subdivision

Kym fenced off 40ha of scrub and subdivided the remaining 360ha into three smaller paddocks. Cyclone (6 70 45) and posts were used for fencing the open country while plain wire was used to fence the scrub to withstand traffic from kangaroos and emus. Water is provided as surface runoff into two dams and each paddock has access to one dam.

Benefits

By splitting the paddock into three, Kym is now achieving a more even grazing over the total area. He has been able to keep pastures in growth stage two (between 800 and 2500kg DM/ha) which has improved feed quality. Feed utilisation has also been improved due to increased stocking pressure in the small paddocks.

With stock having less distance to walk to water, they are able to maintain their condition for longer. Camping and tracking was also reduced by continually rotating stock between paddocks.

Kym believes his lambs do better in the smaller paddocks. When feed can be kept shorter over the whole paddock, rather than having both bare and rank growth. The decision to move his stock into a confinement feedlot was also delayed because adequate ground cover was maintained for longer.

This season, Kym plans to split a 40ha section from a 120ha paddock and use temporary electric fencing to graze a green wheat crop through winter. This grazing strategy is not to increase his sheep numbers, but it should allow him to crop more of his property and provide flexibility to the whole farm system.

Kym Villis in subdivided paddock using permanent fencing.

Paddock subdivision allows for grazing control and flexibility

PROPERTY INFORMATION

Producers: Bradley and Kelly Lynch

Location: Chandada

Property Area: 5,250ha

Enterprise: 1800 Merino ewes joined to Merino and terminal sires

Annual Rainfall: 350mm

Creating smaller paddocks for grazing has allowed Bradley Lynch to improve pasture utilisation and achieve better weed control.

Bradley found his sheep were preferentially grazing the southern end of the paddock. They concentrated their grazing close to water, leaving its eastern sections largely untouched because it was too far to travel back to water and away from prevailing winds.

Dividing the paddock

The 260ha paddock was divided into two sections of 90ha and one of 80ha. Fences were constructed using timber posts spaced at 15m, 5-line 45cm stocklock and a top barb wire. In future he is likely to add spacers between the posts, to provide more rigidity to the fence.

A central, 3-way yard, servicing the three smaller paddocks has been built to provide stock water at a single 2.4m concrete trough off a 40mm OD metric blue line poly mains supply line.

The benefits

Splitting the paddock up into three smaller sections has now provided greater flexibility when grazing this area of his property.

Previously a single mob of 350 sheep would be grazed over the total paddock but now two smaller sections can be run separately, while leaving feed to get away in the third.

In the past Bradley would have needed to control spray turnip weed pre-cropping, but the increased stocking pressure now allows the weed to be managed through grazing. The effectiveness of spray grazing has also improved as the higher grazing pressure allows more weeds to be eaten while palatability is temporarily increased.

Bradley has further plans to subdivide a 485ha paddock into four sections and stretch an existing water line to a central point, to improve the grazing efficiency over this section of his farm.

Bradley Lynch

PRODUCER CASE STUDY

Changing management to increase stocking rates at Ceduna

PROPERTY INFORMATION

Producer: Neville Hoffrichter

Location: Ceduna

Property Area: 2,100ha

Enterprise: 800 ewes joined to Merino and SAMM sires

Annual Rainfall: 300mm

Neville Hoffrichter knew that to increase stock numbers and move towards a 50:50 sheep/crop enterprise mix he would have to improve grazing efficiency. By conducting a number of small on-farm trials, he found that this could be achieved through paddock subdivision combined with rotational grazing and increasing water flow rates to troughs.

The plan for his farm is to permanently divide paddocks that are 320ha into two 160ha paddocks. This will still provide a suitable sized area for cropping. The dividing fence will have a central water point that is permanently fenced with access from four points.

When the 160ha paddocks are in the pasture phase they will be divided into 80ha sections using an electric fence. The electric fence will be three wires constructed using 2.5mm fencing wire and steel posts and stay in place for 2-3 years. After three years it will be removed for a cropping phase.

Temporary electric fencing may also be used to subdivide paddocks further to intensively graze cereals.

Trial results - Left paddock set stocked compared with right paddock which was rotationally grazed and has greater cover.

Rotational grazing trial

In 2008/09 Neville trialled the future paddock plan (diagram 1) in a wheat stubble that had not been grazed, to see what impact it would have on stubble grazing management. Temporary electric fencing was erected using the Rappa™ system.

On the 27th of December, 200 dry ewes were set stocked in the 160ha paddock while 245 SAMM lambs (45-55kg live weight) were rotated between the two 80ha sections. The lambs were shifted every two weeks from one side to the other.

By the 19th of February feed had run out in the 160ha paddock, and ground cover was low, requiring the ewes to be removed. In comparison, the lambs were able to graze their 160ha area for an extra 19 days before being sold on the 10th of March, averaging 23kg dressed weight.

The trial showed that the number of grazing days can be increased by splitting the paddock and rotational grazing the area compared with set stocking the paddock.

With smaller paddocks his sheep are grazing less selectively and using less energy walking to water and looking for the best feed. This also means they are trampling less feed in the process.

Neville observed that the mob in the larger paddock would come into water then walk all the way back to the other end of the paddock before starting to graze. At crutching he also noticed that the ewes were in the lowest condition and had the most dirt in the wool.

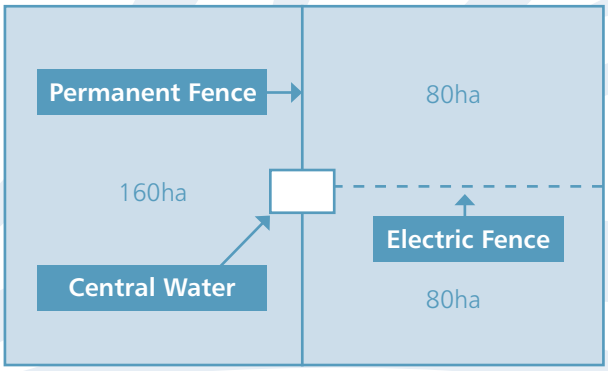


Diagram 1: Trial paddock layout

Central water point with header tank in background.

Changing the livestock watering system

Neville had always been sceptical when people talked about high water flow rates into troughs encouraging sheep to spend less time at watering points and more time grazing. He decided the only way to know for sure was to trial it himself.

The trial was a great success and Neville has commenced a program to boost water flow by putting 2,500 litre capacity poly tanks alongside troughs.

Historically all water pipe delivery to troughs on the property was 25mm ID Rural B' Class but Neville is now converting over to 50mm ID Rural B' Class diameter from tank to trough and a 32mm float valve.

As a direct result of these changes in pipe size and inlet flow rates, Neville has observed his sheep are now coming into water and then leaving more quickly than in the past. This has resulted in less baring out of ground around the watering points and cleaner wool through less dust contamination. He knows the sheep are drinking but never sees them hanging around the water like they did in the past.

In the past, Neville has always positioned his stock troughs facing north-south. This was to ensure dust and floating debris was blown by prevailing winds away from the trough inlet, which is the preferred site for stock to drink from. However, since increasing trough inlet flows, this material no longer accumulates on the water surface and his sheep drink from the troughs full length, further reducing the time taken for a mob to obtain a drink.

Upgraded water system to left versus old system to the right.

Neville locates all his tanks and troughs on stands built using re-cycled truck tyres and allows the ground around the watering point to compact before concreting a 2m wide pad around the trough, to prevent further soil erosion and drift.

Changing watering systems pays dividends

PROPERTY INFORMATION

Producers: Roger and Chris Lienert

Location: Arno Bay

Property Area: 2,670ha

Enterprise: 1,000 Merino ewes joined to terminal sires

Annual Rainfall: 300mm

Roger Lienert at the new header tank.

Fencing a section of his property to account for grazing preferences and re-designing the stock watering facilities has enabled Roger Lienert to obtain more grazing from his Septa lucerne pasture.

The issue for Roger was that the 134ha paddock contained 76ha of lucerne on the sandier end and 58ha of stonier country that could be cropped. This led to grazing inefficiencies due to the different pasture types and put the paddock at risk of erosion.

Grazing lucerne

Roger erected a permanent fence across the paddock, dividing the lucerne from the cropping area.

This strategy enabled grazing pressure to be increased and the lucerne to be fully utilised. The lucerne would be hard grazed for four weeks prior to resting.

Traditionally the lucerne stand received a single spray for grassy weeds and insects.

In 2008, following the re-fencing, the first grazing of the lucerne occurred in mid-June, with 300 ewes and 250 lambs for nine days. Subsequent grazing occurred in mid-July, late August, mid-September and late January 2009. The lucerne provided a total 62 grazing days and utilised 642kg of dry matter per hectare. The stocking pressure (while the sheep were in the paddock) was 10DSE/ha. In addition, the fence has enabled the bottom of the paddock to be excluded from grazing and provided a bonus grain yield.

Central watering point.

Stock watering facilities

Paddocks on the property were traditionally set up with individual water troughs. However, when the new fence was erected, a three-way entry yard was also established along the paddock's eastern perimeter fence line. This now provides Roger with the flexibility to water stock from three separate paddocks from a single trough. It results in a reduction in infrastructure capital costs for the paddocks being subdivided.

Mains water had traditionally been supplied to the paddock through a 25mm OD metric blue line class 12.5 poly pipe line direct to a trough. This struggled to keep up with peak summer demands.

Now a 25mm OD diameter poly line is still used to deliver water, into a newly purchased 4,500 litre poly header tank. From here water is gravity fed through underground 50mm ID Rural B'Class poly to a single, 2.4m concrete trough.

This ensures large mobs of sheep can drink cooler, fresher water quickly and then return to the paddock, reducing the potential for drift occurring around the watering point.

Trough flow rates

The trough riser is 50mm ID, before reducing to a 25mm inlet and ball float valve. The 25mm inlet into the trough is not ideal and restricts flow rate. A recent flow rate test conducted at the trough has shown further improvements could be made by increasing the diameter of the ball float valve inlet from its current 25mm to 50mm, which would improve the flow into the trough from 0.6L/sec, to 1.2L/sec. The flow rate into the tank is 0.18L/sec which provides 15,552 litres over 24 hours.

Roger had traditionally used 3.6 - 4.9m length concrete troughs for watering sheep on his property. With this new installation he is only using a 2.4m length, made possible by the higher inlet flow rates which will allow larger numbers of sheep to be adequately watered over the shorter length.

It is the combination of additional fencing and improved stock watering facilities which has now allowed Roger to maximise the grazing potential of his lucerne and ultimately the profitability of his sheep enterprise.

New farm plan improves grazing potential

PROPERTY INFORMATION

Producers: Shannon and Shenae Mayfield

Location: Kimba

Property Area: 1,212ha

Enterprise: 900 ewes to terminal sire and trading 2-3,000 lambs annually

Annual Rainfall: 325mm

Shannon Mayfield standing at clayed central watering point.

Shannon Mayfield was looking to improve his whole farm management by taking his less profitable cropping country out of rotation and developing it into more profitable grazing.

Through developing a new farm plan based on land class and past crop yield information, Shannon identified a total 370ha which was more suited to long term grazing than to cereal cropping.

Existing paddock size ranged from 90 to 140 hectares. This was efficient for the cropping program, however experience showed that sheep tended to selectively graze and bare out parts of the paddock, leading to drift, while other areas remained under-grazed.

The aim was to have smaller paddocks to more effectively control grazing and maintain ground cover.

Paddock design

It was decided the 370ha suited to long-term grazing would be permanently fenced to create eight smaller paddocks approx 40 to 50ha in size. The new fencing would also follow variations in soil type and contour.

The challenge for Shannon was where to position central stock watering points, given much of the land was deep sands. He wanted to avoid the capital costs associated with having to supply a trough in every paddock, and to reduce the distances stock would need to walk to water. However, central watering points would be at high risk of erosion on the sandy soils.

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Central watering points

Initially four of the eight paddocks were set up with a four-way central watering facility. A new 4,500 litre poly tank with saucer trough, serviced by a 32mm delivery line from the mains, was located within a 20m x 20m permanently fenced yard. This yard provided the flexibility to water the stock from any of the four paddocks.

The issue for Shannon with having a single watering point for four paddocks, is that only one mob of sheep can be run across the four paddocks at one time, compared with current management where sheep have been run in a number of small mobs especially at lambing. Therefore, management will have to be changed.

To reduce the risk of erosion on the sandy soil and to provide a solid base for the water tank, Shannon is trialling the use of a clay pad. Clay was spread over the soil surface inside the yard to a depth of 20cm. He has also spread clay along a proposed laneway, to reduce erosion and drift when stock are shifted.

The success of the clay pad in the central watering point will determine if this same approach will be used for the site selection and design of new sheep yards on the property.

Grazing benefits

Disc seeded barley with no fertiliser or chemicals inputs is going to be the pasture base for the grazing paddocks. One paddock currently has lucerne with further paddocks to be sown in the future.

The subdivision of a 140ha paddock into four smaller paddocks using permanent fencing has allowed grazing pressure to be increased resulting in more even grazing and better pasture utilisation.

The costs associated with making this change were minimised through the use of central watering points and the design of fence lines to follow soil type which enables grazing of land to be managed according to capability and reduces the risk of erosion.

Overall, Shannon Mayfield has been able to make more effective use of the feed available across the total acreage.

This simple case study demonstrates how extra feed utilisation can be achieved through the growing season and before stock have access to stubbles over summer by subdividing large paddocks to increase grazing pressure.

Clayed laneway across sandy paddock for stock and vehicle movements.

Making the transition from cropping to grazing on high risk cropping land

Daniel Schuppan, Livestock Consultant, Rural Solutions SA

Trial Details

Objective: To assess different pastures and fencing options to improve the productivity of high-risk cropping land

Duration: 2008

Location: Lipson

Farmer Cooperator: Brenton Solly

Soil Type: Sodosal - red sandy loam

Paddock History: 2007 10ha Winteroo oats and 10ha Saia oats

Annual Rainfall:
2008 - 245mm
Average - 300mm

West fence $844 per km
4 plain wires (2 live)
Galv dropper spaced at 20m
Pin lock insulators
Plastic end wire strainers

East fence $956.66 per km
4 plain wires
Wooden post spaced at 40km
Fibreglass posts spaced at 20m
Post insulators

North fence $1,011 per km
3 plain wires (2 live)
Wooden post spaced at 30m
Pin lock insulators
Porcelain wire ratchet strainer

South fence $1,246 per km
4 plain wire (2 live)
Galv droppers spaced at 45m
Fibreglass post spaced at 15m
Post insulators

Table 1: Fence construction and cost.

Treatments

A rectangular 20ha paddock was sub divided into four 5ha rectangular paddocks using 4 different types of permanent electric fencing. Each fence was constructed differently (table 1).

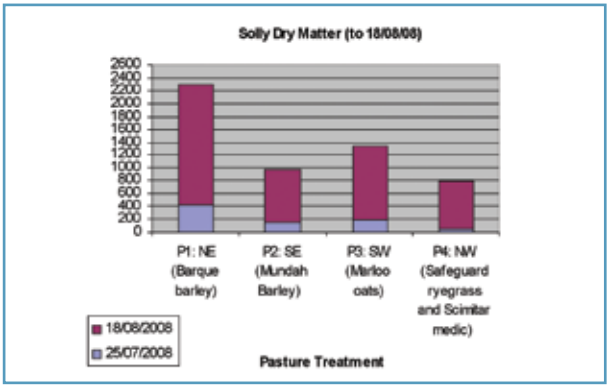
A 2.8 joules solar energizer was used to power the fence.

Each paddock had a different pasture variety sown dry on the 4/6/08 (table 2).

A central watering point was constructed in the middle of the four sections. A square pen was constructed around the trough with gates that opened to allow water to each paddock (photo 1). A 2.4m concrete trough was used with mains water at high pressure providing over 1 litre per second flow rate.

Key Outcomes

- Use seed grown on farm to reduce the costs of growing cereals for grazing.
- Growing cereals provides flexibility eg. graze green, harvest, hay, graze standing crop.
- When grazing cereals increased stocking rates must be achieved to cover additional costs.
- Electric fencing and central watering points are options to reduce costs of paddock subdivision and to improve grazing management.



Graph 1: Dry matter per hectare

Trial Results

Pastures, Grazing and Grain

Dry Matter (DM) cuts were completed on 25/7/08 and the 18/8/08 across each different pasture. Graph 1 shows that the cereals had produced more dry matter early than the Safeguard ryegrass and medic. The Barque barley had the highest DM/ha but it was growing on better soil than the Mundah, which had large patches of magnesia throughout.

The total DM cuts for the growing season were not taken but grazing days were recorded to determine how much dry matter was utilized and the stocking pressure and rate of each pasture variety.

The barley was in the late flowering stage when the sheep were available to graze it. Grazing started on the Barque barley but on inspection it was decided that one paddock should be left un-grazed and harvested, as the feed was not required. The Barque barley had a light graze and was shut up for harvest as the owner was not registered to harvest Mundah barley. The Mundah barley was grazed at late flowering.

The light grazing of the Barque barley had little effect on grain production and 0.85t/ha was harvested. The sheep utilized 1.2 t of DM from the paddock, which included stubble.

The Mundah and Oats provided similar grazing. Approximately 1.4t DM/ha was utilised. The Mundah barley also provided some grain for grazing as it went to head while the oats did not.

Photo 1: Four paddocks watered by a central watering point.

The Safeguard ryegrass and medic provided the lowest DM production but was allowed to set seed. Approximately 400kg of DM/ha remained in the paddock and this could be grazed.

Having a large mob (high stocking pressure) in a small paddock resulted in even grazing across the paddock. The sheep grazed the oats closest to the water first before moving across the paddock. When the Mundah barley was grazed the sheep selected the plants growing on the higher magnesia areas first. These plants were smaller than the plants that had grown well in the good soil areas of the paddock.

The stocking pressure of between 32 and 45DSE/ha was very good to achieve even grazing. The stocking rate for the year ranged between 1.7DSE for ryegrass/ medic to 4DSE/ha for the cereals.

Section	Area (ha)	Pasture	Seeding rate (kg/ha)	Seed cost ($/ha)	Fert (22:15) rate (kg/ha)	Fert cost ($/ha)	Chem cost ($/ha)	Labour & tractor hours etc.	Total cost ($/ha)
NE	5	Barque Barley	70	19	25	23.4	7.3	30	79.93
SE	5	Mundah Barley	70	57	25	23.4	7.3	30	117.40
NW	5	Safeguard Rye & Medic	20 & 5	143	25	23.4	7.3	30	203.30
SW	5	Marloo Oats	70	61	25	23.4	7.3	30	121.60

Table 2: Pastures sown in each paddock and associated costs.

Fencing

There were some minor issues with the fencing but overall the different types of electric fencing all worked successfully to hold the sheep in. All fences were 800mm high except the north fence, which was 700mm. This was too low with some sheep jumping over. The best fence was the west fence (table 1), which provided a physical barrier having four wires and 2 live. This was also the cheapest fence.

The wooden posts used in the construction of the fences could have been smaller in diameter to reduce the cost.

Fibreglass posts would not be used again as they eventually go brittle and splinter.

Porcelain insulators are more expensive but have greater longevity.

The initial earth for the electric fence was not set up correctly and provided some earthing problems but this was easily corrected.

Pin lock insulators were used on sections of the wood and steel post so that wire could be dropped onto the ground and machinery driven over to move from paddock to paddock.

Water

The 2.4m trough was more than sufficient for watering the sheep in the four paddock system. The flow rate of over 1L per second was sufficient to allow the sheep to water in a short period of time.

	Safeguard Rye grass & Scimitar medic	Barque Barley	Mundah Barley	Marloo Oats
Days in period	365	365	365	365
Days grazed	20 green	7 green & 12 stubble	35 green	32 green
Days closed	345	346	330	333
DSE days	3180	3791	7298	7042
DSE days per ha	636	758	1460	1408
Stocking pressure DSE/ha (when grazed)	32	40	42	44
Stocking rate for period DSE/ha (365 days)	1.7	2.1	4.0	3.9
Pasture used @1kg/ DSE (green feed) (kg DM/ha)	636	223	1460	1408
Pasture used @ 1.5kg/DSE (dry feed)(kg DM/ha)	0	804	0	0
Grain Yield	0	0.85t/ha	0	0
Establishment Costs $/ha	$203.30	$79.93	$117.40	$121.60
* Estimated Gross Margin/ha (not including above pasture establishment costs)	$42.50	$140.00 (includes grain)	$100.00	$97.50

Table 3: Grazing records from each paddock.

** The estimated gross margin was calculated by multiplying the stocking rate by $25 ($25 is the GM for a self-replacing Merino flock per DSE), barley was valued at $130 per tonne.*

Cost of establishment

The Safeguard and medic pasture was the most expensive to establish. The aim was to allow this pasture to set seed so it can regenerate annually without further sowing costs. The seeding rate of Safeguard rye grass was too high at 20kg/ha and could have been sown at 6-10kg/ha. This would have reduced the establishment cost by $50-$70 per hectare.

The Barque barley was the cheapest cereal as the seed was on hand and valued at June 08 prices. The seed cost of Mundah barley and Marloo oats was high due to having to purchase the seed.

Gross Margin

The estimated gross margin from the sheep does not cover the cost of growing three of the pastures. The Barque barley cost was covered only because the value of 0.85t/ha of grain was added to the grazing income.

Comments

The Safeguard ryegrass and medic was selected as a pasture option that could provide a quality annual self-regenerating pasture. The Safeguard ryegrass is resistant to Annual Ryegrass Toxicity and the Scimitar medic is more tolerant to salinity than other varieties. The cereals were chosen to see how they would perform on the Sodosal soil type.

Due to the location of the trial paddocks in relation to where the sheep were and when they could be moved, grazing occurred too late. The oats were haying off when grazing commenced and the barley was in late flowering. Grazing should have commenced earlier to utilise the feed while it was better quality.

The late sowing date and dry spring affected dry matter production and therefore if more grazing could have been achieved the cost could have been covered and a profit made.

It is unknown how much Safeguard ryegrass and medic seed was set and how much will germinate in 2009. If the pasture regenerates over a number of years then this will reduce pasture establishment costs and only a maintenance P fertilizer would be required. This would be a simple pasture for grazing.

The barley also appeared to be more productive on the soil type and this is due to barley being more salt tolerant than oats, ryegrass and medics.

Having a small trough with high flow rate and a central watering point reduces the watering system costs when setting up a grazing system.

Use cereal seed on hand to reduce establishment costs.

Conclusion

When taking unprofitable high risk cropping paddocks out of production it is important to consider the costs to make them profitable grazing paddocks.

Make sure the pasture establishment costs are known and the required amount of production that can be achieved to cover costs and make a profit. Although there may be more feed produced, the profit may be no more than a low input system.

If growing cereals, consider requirements of fertilizer and herbicides. These may not be required which will reduce the establishment costs. Be aware of the agronomic implications if cropping the paddock in the future.

Set up a grazing system and have sufficient livestock available to utilize the pasture grown so it is not wasted. Growing cereal for grazing gives the flexibility that if the feed is not required then it can be shut up for grain, hay or as a standing crop.

When deciding on a pasture, select varieties that are suited to the soil type and rainfall but will also provide the quantity and quality of feed needed for livestock.

The first step to increasing grazing efficiency should be to better utilize exiting feed through improved grazing management. Once this is achieved, use cheap fencing to subdivide paddocks and central watering points before establishing expensive pastures.

Acknowledgements

Brenton Solly - farmer cooperation

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EPNRM Board, Woolworth's - Profitable and Sustainable Farming Systems Project

Australian Governments Caring for our Country program.

Grazing cereals at Edillilie 2008

Kieran Wauchope and Daniel Schuppan, Rural Solutions SA, Port Lincoln

Key Messages

- Without a good spring crop yields struggle to recover from heavy grazing.
- Wide row spacing on sandy soils make it difficult to produce enough dry matter to graze without risking erosion.
- High stocking pressure is essential for even grazing.
- Understanding different stock feed requirements is important to ensure demand is met.
- Livestock can make timing of chemical and fertiliser applications difficult.

Why do the trial?

Previous research into grazing cereals has focussed on plot work with mowing used as the method of simulating grazing. The aim of this demonstration was to investigate, on a paddock level, the logistical and agronomic implications of grazing cereals and harvesting for grain yield. In addition to this the 'rules of thumb' suggested from trial plot work needed to be tested for the Lower Eyre Peninsula farming systems.

How was it done?

A 47ha paddock was sown with a ConservaPak on 12 inch row spacings on 21 May. Flagship barley was sown at 80kg/ha with 80kg/ha DAP below the seed. Pre-sowing spray included Credit, Bonus, Trifluralin, Diuron, Hammer and in-crop spray was Hoegrass, Jaguar, LVE MCPA and wetter.

On the 10 July the 47ha paddock was divided into four sections using a three wire temporary electric fence and the Rappa™ system to erect. One section was left un-grazed and the other three were grazed with Merino ewes at different intensities for varying durations. Measurements were taken on available dry matter (DM), crop growth rates, DM at the start and end of grazing, total grazing days and grain yield and quality. The crop was harvested on the 18 of November.

Daniel Schuppan using Rappa™ system to roll out wire.

What happened?

Once the crop emerged regular assessments were made on growth stage, how well the plants were anchored and available DM until there was sufficient ground cover and bulk to carry the mobs of sheep planned for each section. With wide row spacings and sandy soils the stock could not be put on the paddock until the 10 July, when the crop was at Zaddocks growth stage (GS) 30. This was later than ideal but there was still only 300kg/ha of DM available for grazing, which is much less than the previously suggested 800kg/ha (Grain & Graze, 'Free Food for Thought - Grazing Winter Crops Roadshow workshop notes', March 2008).

The sections were stocked with Merino ewes at different stages of pregnancy and lactation which influences their feed demands and intakes. Ninety ewes with 6-8 week old lambs at foot rated at 3.2 dry sheep equivalent (DSE) were stocked in the north west paddock while eighty ewes that were just starting to lamb rated at 2DSE were stocked in each of the other sections.

The stocking pressure (grazing intensity) had an impact on how even the sections were grazed and the grazing period. The north west paddock had the highest grazing pressure of 25DSE/ha and had the shortest grazing period of 8 days. The sheep in this section were consuming more than the daily growth rate (Table 1) of the crop and the initial 300kg of DM that was on offer at the start of grazing was also utilised. This section was very evenly grazed to the same height all over. The sheep had to be removed after 8 days due to there only being 50kg of DM/ha on offer.

The stocking pressure in the south east section was 16DSE/ha and the stock stayed in the paddock for 11 days. The paddock was unevenly grazed with the crop being at different heights across the paddock. The sheep in this section also started pulling plants out of the ground in one corner of the paddock and were removed as a result.

The stocking pressure in the south west paddock was matched closer to the growth rate of the crop but was still above the growth rate. The paddock was unevenly grazed with the crop being at different heights across the paddock. The stock grazed for 15 days and by this stage the crop was near GS 32, well past the usual recommendation of taking them out by GS 31. Although this was the case the stock did not eat the growing points of the developing crop.

Table 1 shows the approximate growth rates of the crop at different periods calculated from dry matter cuts. It was difficult to match livestock demand with the growth rate of the plants due to growth rate variations.

Between 173 and 202kg of DM/ha (Table 2) was utilised in the different sections using the method where 1kg of DM is allocated per DSE per day. Between 60-80% of the feed on offer was estimated to be utilised with only 20-40% wastage and this is due to high stocking pressures and small paddocks.

No problems were experienced with sheep getting through the electric fence.

Stubble cuts showed the paddocks with the most dry matter removed from grazing had the lowest amounts of stubble dry matter, and lowest grain yield (data not shown).

Period	Growth rate (kg/ha/day)
27 May - 1 July	4.5
1 July - 10 July	16.7
10 July - 25 July	8.6
27 May - 25 July	7.1

Table1: Crop growth rate of Flagship barley at various stages of crop development at Edillilie.

Section	North West	North East	South West	South East
Grazing treatment	**Heavy graze**	**Un-grazed**	**Light graze**	**Light graze**
Size (ha)	11.4	11.7	13.8	9.9
Stock #s	90	0	80	80
DSE rating	3.2	0	2	2
Stocking pressure (DSE/ha)	25.3	0	11.6	16.2
Date stock in	10 July	n/a	10 July	10 July
Date stock out	18 July	n/a	25 July	21 July
Days grazed	8	0	15	11
DSE days	2304	0	2400	1760
DM utilised/ha (allocation 1kgDM/ DSE/day)	202.1	0	173.9	177.8
DM on offer at start of grazing (kg/ha)	300	300	300	300
DM on offer at end of grazing (kg/ha)	50	420	n/a	n/a
Stubble DM 8 Dec (t/ha)	1.36	1.86	1.44	1.79

Table 2: Grazing management, DM utilised and DM available after grazing Flagship barley at Edillilie 2008.

Effect on grain yield and quality

Grain yield was reduced by between 0.17t/ha and 0.69t/ha (Table 3) where stock grazed the developing crop in comparison to the un-grazed yield. Large differences are also observed in grain quality with an increase in screenings from 9% up to 19.9%, resulting in a downgrade from Feed 1 to Feed 2. Additionally the retention and test weight of the grain of the grazed sections was lower than that of the cut off for Feed 1.

Gross margin analysis of the various treatments

To provide a total gross margin for each section the grain yield and grazing value must be combined. To put a dollar value on the grazing, calculations were made on the total dry matter eaten on an energy basis and then valuing it the same as the dollar value of grain with equivalent energy. The best grazing section added $60/ha to the gross margin. The return from grazing varies according to grain prices and the amount utilised per hectare.

The effect of grazing was detrimental to the gross margin of the paddock (Table 4). The section that was grazed heavily did not recover well and made a negative return with barley being valued at $135/t. Each grazed section had lower grain gross margins than the un-grazed section, with the two slightly heavier grazed sections having negative returns. With the value of the livestock grazing being added in gross margins for each grazed section, the returns were still well below that of the non-grazed section.

What does this mean?

The gross margin of Flagship barley in a below average spring rainfall year was negatively affected by a short graze at GS 31 to 32. The value from grazing combined with the value of grain did not out-perform the gross margin of the un-grazed crop. Therefore, it is important to select the right sowing time, crop variety, grazing time and paddock and to understand how the season may affect the yield of the crop.

Early sowing will obviously improve the chances of producing enough feed early in the year without risking erosion, and eliminate significant yield loss from having to graze at a later growth stage than recommended. This will then ensure the crop can recover in the more reliable months of July and August, rather than hope that September and October produce good climatic conditions.

Sowing crops for grazing on sandy soils would benefit from narrower row spacings. 12 inch row spacing leaves too much ground uncovered and with standard seeding rates it can take too long to produce enough bulk to carry a medium sized mob. There is also a risk that heavy grazing on sandy soils can leave the soil exposed to erosion.

Grazing cereals provides feed for livestock while pastures to get established, reduces the cost of supplementary feed and means more livestock can be run. The key to grazing is to understand the animal requirements (daily intake) and the growth rate of the crop. This information can be used to create a feed budget which helps with estimating grazing duration.

Section	North West	North East	South West	South East
Grazing treatment	**Heavy graze**	**Un-grazed**	**Light graze**	**Light graze**
Yield (t/ha)	1.72	2.41	1.88	2.24
Pay Grade	F2	F1	F2	F2
Test Wt (g/hL)	61.8	63.2	60	60
Protein (%)	10.3	9.8	10	9.8
Moisture (%)	12.0	12.8	12.7	12.8
Retention (%)	51.7	69.2	60.1	61.2
Screenings (%)	19.9	9.0	17.3	14.2

Table 3: Flagship barley grain yield and quality results after various grazing treatments at Edillilie, 2008.

The stocking pressure should be matched with plant growth. Therefore the amount of feed consumed per hectare per day should match the daily growth rate of the crop per day. Having the correct stocking pressure allows for even grazing of the paddock so the crop doesn't end up patchy with different areas at different stages of maturity.

Due to variations in crop growth rates and livestock feed demand, pasture paddocks should be nearby so if the crop is being over grazed or reaches growth stage 30, then stock can be quickly moved.

The site also demonstrated that temporary electric fencing is an efficient way of subdividing paddocks. Sub division can be important to control grazing especially if a small mob of sheep are in a large paddock. It allows the stocking pressure to be increased to improve the efficiency and evenness of grazing.

Acknowledgements

Thanks to Terry Secker, Damien Redden and Frank Wauchope for their cooperation and willingness to help with running this demonstration. This site was supported by the Eyre Peninsula Grain & Graze project, LEADA, National Landcare program, EPNRM and Woolworths.

Section	North West	North East	South West	South East
Grazing treatment	**Heavy graze**	**Un-grazed**	**Light graze**	**Light graze**
Grain value ($/t)*	135	160	135	135
Income ($/ha)	232	385	254	302
Variable Costs ($/ha)**	275	275	275	275
Gross margin for grain ($/ha)	-43	110	-21	27
Value of grazing (barley value 1)*** ($/ha)	60	n/a	52	53
Value of grazing (barley value 2)**** ($/ha)	27	n/a	23	24
Total gross margin - barley value 1 ($/ha)	17	110	31	80
Total gross margin - barley value 2 ($/ha)	-16	110	2	51

Table 4: Gross margin analysis and cumulative returns of grain and grazing treatments at Edillilie, 2008.

** ABB Cash price in Port Lincoln, 26 November 2008*

*** Taken from Gross Margin Guide 08, Medium rainfall zone*

**** Calculated by DM consumed, valued at $300/t (ABB 23/7/08) - based on 1kg/DM/DSE/day*

***** Calculated by DM consumed, valued at $135/t (ABB 26/11/08) - based on 1kg/DM/DSE/day*

NB $300/t was the value of feed barley at the time the paddock was grazed, $135/t is the value of the barley at time of harvest.

Trial Information

Location: Edillilie

Farmers: Terry and Diane Secker

Rainfall: 2008 May - Dec
Total: 299mm

Paddock History: 2007, Pasture

Soil Type: Infertile sand

Yield Limiting Factors: Late sowing, soil fertility and lack of spring rain.

Livestock: Merinos

Social/Practice:
Time (hrs): Slightly more hours are required to set up fencing and move stock.
Clash with other farming operations: Having livestock in the paddock when you want to spray growing weeds or apply extra nitrogen can make farm management difficult.

Economic:
Infrastructure/operating inputs: sheep handling labour and electric fencing.
Cost of adoption risk: dependant on spring
Market stability risk: commodity prices change over the season.

Grazed heavily on the left, right is un-grazed.

Un-grazed, lightly grazed and heavily grazed on July 18.

Paddock grazing records

Using a grazing record enables you to assess the productivity of an individual paddock.

The template used for the grazing record example (opposite page) is available as an Excel spreadsheet from Rural Solutions SA. This template automatically calculates values in the white cells when data is entered into the yellow cells.

How to use the grazing record sheet

Step 1: Each time stock enter and exit the paddock enter the required data into the table (yellow cells). Then calculate the required figures in the white cells

- "Days in period" = the number of days between the "date in" and date out" dates
- "Days grazed" = "0" when the paddock is closed and the "Days in period" figure when stock are in the paddock
- "DSEs for mob" = number of stock x 'DSE's per head' rating
- "DSE days" = "DSEs for mob" x "days grazed"

Step 2: At the end of the recording period calculate the figures in the grazing summary

- "Days in period", "Days grazed" and "DSE days" = the totals for the respective columns
- "Days closed" = "days in period" - "days grazed"
- "DSE days per ha" = "DSE days" ÷ number of ha in the paddock
- "Stocking pressure" = "DSE days per ha" ÷ "Days grazed"
- "stocking rate for period" = "DSE days per ha" ÷ "days in period"

How to use the information

Information from grazing records can be used to:

- Determine how productive a paddock is which can help set rest periods, grazing periods and grazing intensity
- Compare performance of pasture species
- Monitor pasture productivity and stocking rate over a number of years
- Compare different grazing management practices (i.e. rotational grazing versus set stocking)

Paddock grazing record

Print date
28-May-2009

Farm: Block
Paddock: Six mile
Area: 120 ha

A	B			C	D			E					
Stock grazing paddock				Grazing period				DSEs			Pasture and feeding		
Type of stock	Number	Fat score or liveweight IN	Fat score or liveweight OUT	Date In	Date Out	Days grazed	Days in period	DSEs per head	DSEs for mob	DSE days	Available pasture (kg/ha) before grazing	Available pasture (kg/ha) after grazing	Hand feeding MJ per day
Closed				1-Jan-2008	20-Apr-2008	0	110		0	0			
Lambing ewes	180			20-Apr-2008	18-Jun-2008	59	59	3	540	31860			
Closed				18-Jun-2008	8-Jul-2008	0	20		0	0			
Ewes l/f	566			8-Jul-2008	23-Jul-2008	15	15	3	1698	25470			
Closed				23-Jul-2008	12-Sep-2008	0	51		0	0			
Weaners	422			12-Sep-2008	12-Oct-2008	30	30	1.2	506	15192			
Closed				12-Oct-2008	31-Dec-2008	0	80		0	0			
						0	0		0	0			

Grazing summary

Days in period	365	
Days grazed	104	
Days closed	261	
DSE days	72,522	
DSE days per ha	604	
Stocking pressure	6	DSEs per ha
Stocking rate for period	1.7	DSEs per ha

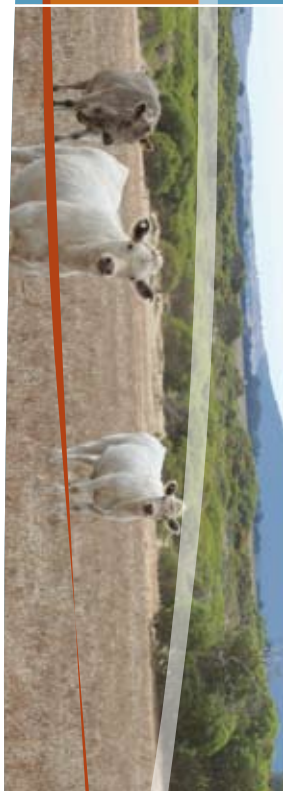
Pasture used

@ 1.5 kg per DSE (dry feed)	907	kg DM per ha
@ 1 kg per DSE (green feed)	604	kg DM per ha

Standard DSE rates

Sheep type	DSE rating	Weaned lambs	DSE rating	Growing or fattening sheep	DSE rating	Assumptions
50 kg adult dry sheep or ewe in early pregnancy	1	20 kg lamb growing at 50 g a day	0.6	40 kg hogget growing at 50 g a day	1.2	Maintaining weight
60 kg adult dry sheep or ewe in early pregnancy	1.2	20 kg lamb growing at 100 g a day	0.8	50 kg hogget growing at 50 g a day	1.5	Maintaining weight
50 kg ewe in late pregnancy	1.3	20 kg lamb growing at 150 g a day	1	40 kg hogget growing at 100 g a day	1.6	Single lamb (twin 1.5 DSEs)
60 kg ewe in late pregnancy	1.6	40 kg lamb growing at 50 g a day	1	50 kg hogget growing at 100 g a day	1.9	Single lamb (twin 1.8)
50 kg ewe with lamb at foot	2.5	40 kg lamb growing at 100 g a day	1.3	50 kg adult growing at 50 g a day	1.4	Single lamb (twin 3.4)
60 kg ewe with lamb at foot	2.9	40 kg lamb growing at 150 g a day	1.5	50 kg adult growing at 100 g a day	1.8	Single lamb (twin 4.1)

Example of a paddock grazing record sheet.



Electric fencing tips

Source - Gallagher Livestock Information Systems

How power fencing works

An energizer supplies the fence with a SHORT, SHARP but HARMLESS shock along a properly constructed and insulated wire. When contact is made between the live wire and a good earth the circuit is completed and a MEMORABLE SHOCK is received.

A well constructed fence should:

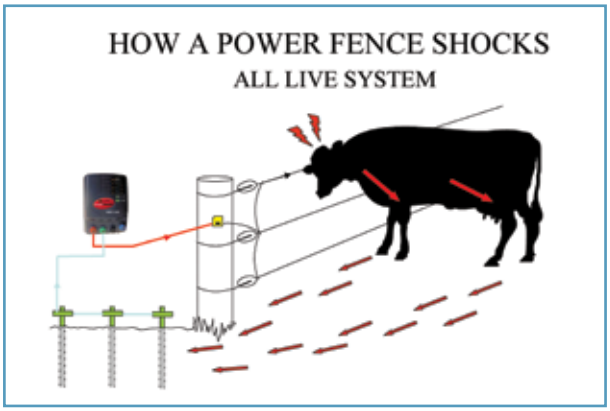
- Be well insulated.
- Have all joints clamped.
- Be the correct height above the ground.
- Have correct wire tension.
- Have adequate conductivity for the length of fence.
- Have all live wires connected in parallel at both ends of the fence.

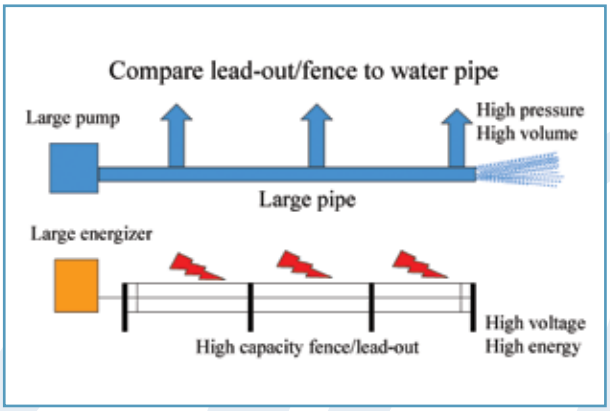
The performance of the fence depends upon:

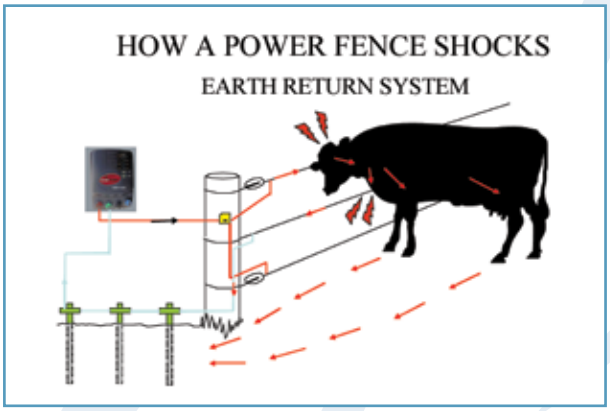
- A powerful enough energizer
- An adequate earthing system
- A well constructed / insulated fence
- An adequate lead-out

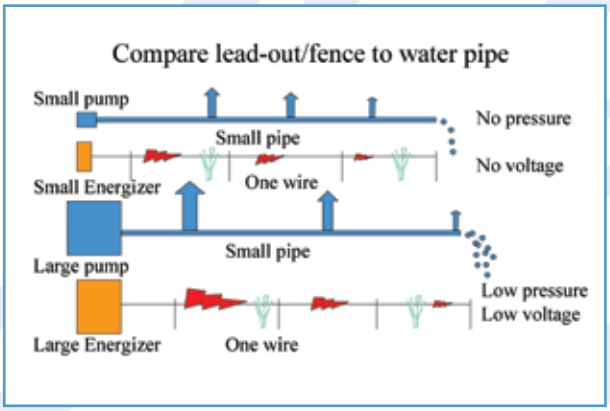
Safety Requirements

- Don't use power poles to support electric fence or lead - out wires
- Electric fences bordering public walkways require regulation warning signs
- Be aware of telephone line interference
- Never run two units together



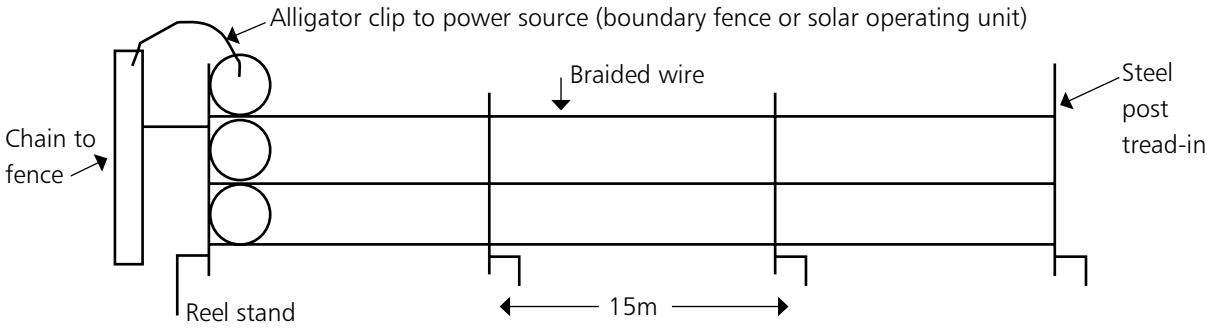






Temporary electric fencing

3 Live Wire Temporary



Recommended Equipment

Energiser

A 2.5 to 3 joule solar energiser is the minimum required for sheep and most strip grazing situations. Note - this sized unit may seem excessive, but provides plenty of power to shock the sheep and allows for any faults in the system such as grass touching wires.

Wire

Braided wire is used in preference to tape which flaps in the wind. Use the high quality braided wire with 9 strands of wire. It is more expensive but will last longer and provides 6-7000 volts after 1km compared to 5-600 volts with the cheap braided wire.

Posts

Steel tread-ins are the most robust and sturdy and therefore recommended. Plastic tread-ins can break and re-use is limited. Steel post (droppers) can be used with insulators. They are sturdy in sand but are hard to shift if the fence is moved regularly. Posts can be made on farm from steel rod with the use of insulators.

Reels

Reel stands can be constructed on farm. Large reels are available which hold 1km of wire. Make sure reels are geared to reduce time required to wind wire up.

Battery

Deep cycle

Lightening diverter

Should be used if you want warranty.

Item	Number	Cost	Total Costs
Reel stand	1	$46	$46
Reels	3	$110	$330
Steel post tread-in	66	$6.35	$420
Braided wire	7.5x400m	$113	$850
		Total	**$1646**
3 joule energiser		$1000	

Table 1: Approximate costs for a 1km 3 wire temporary electric fence.

Tips

Setup

- Face solar panel north
- Put battery in an old esky to avoid temperature fluctuations and increase battery life
- Avoid grass touching wires and shorting out the system
- Use a tester to test fence for power

Earthing system

- Use galvanised earth stakes
- It is very important to set up correctly (seek advice)

Wire height

- Spacings on steel tread-ins are adequate. However they can be shifted as required (refer to images on page 44)

Number of wires

- 2-3 live wires are adequate in winter
- An earth wire is required when there is no moisture in the soil.

Wire tension

- Do not tension tight as it will stretch the braided wire

Post spacings

- 15-20m is adequate depending on the level of the ground

Joining wires

- Braided wire can be tied together
- Use insulated wire and clamps for other joining eg. earth and power source

Stock Movement

- Lift up the fence using a steel peg, move stock under wire
- Move reel stand, or use end of fence as a gate

Management

- For ease of management subdivide paddock at the start of the season and leave fences up where possible so stock can be rotated. Eg. A simple 4 paddock rotation
- If moving fence along a paddock have a single wire power source down one side of the paddock.

Rappa™ system

- Costs approximately $2,700 plus reels
- Erects and pulls down 1km of fence in 1 hour
- Requires special reels which only fit 500m of braided wire.

Rappa™ system

Top left, above and bottom right: Fence setups

Livestock watering tips

Develop a water plan and reticulation scheme even if it takes 5 years to put in place.

Daily water requirements

Daily water requirements for different classes of livestock are outlined in table 2. When estimating how much water should be allowed the following factors must be considered:

- Salinity of water
- Size of stock
- Species of stock
- Time of year
- Feed type
- Lactating animal
- Walking distance

Water budgeting

When determining total water requirements, consider spillage, evaporation, cleaning, and seepage from dams in addition to stock requirements.

Water troughs

Location is important for pasture utilisation. A central location in the paddock is ideal. Long troughs are not needed, provided flow rate is good. Troughs of 2.4m - 3.6m in length are recommended. Use portable troughs that can be shifted with stock to reduce costs.

Flow rate into the trough - *This is the key*

Livestock should be able to come in and get a drink without waiting for water. Flow rates are outlined in table 3.

Animal	Litres per day
SHEEP	
Weaner	2-4
Adult dry sheep - grassland - saltbush	 2-7 4-14
Ewes with lambs	4-10
CATTLE	
Weaners	25-50
Dry stock	35-80
Lactating cow - grassland - saltbush	 40-100 70-140

Table 2: Livestock daily consumption

Mob size (DSE)	Suggested flow rate L per second
1000-2000	1-1.5
2000-3000	1.5-2
3000-5000	2-3
Greater than 5000	3

Table 3: Required flow rates

Further information

- Intensive rotational grazing, Tips & Tools, Meat & Livestock Australia, 2007

  Website: www.mla.com.au
  Search under grazing management

- Gettting started with simple timebased roational grazing, Tips & Tools, Meat & Livestock Australia, 2007

  Website: www.mla.com.au
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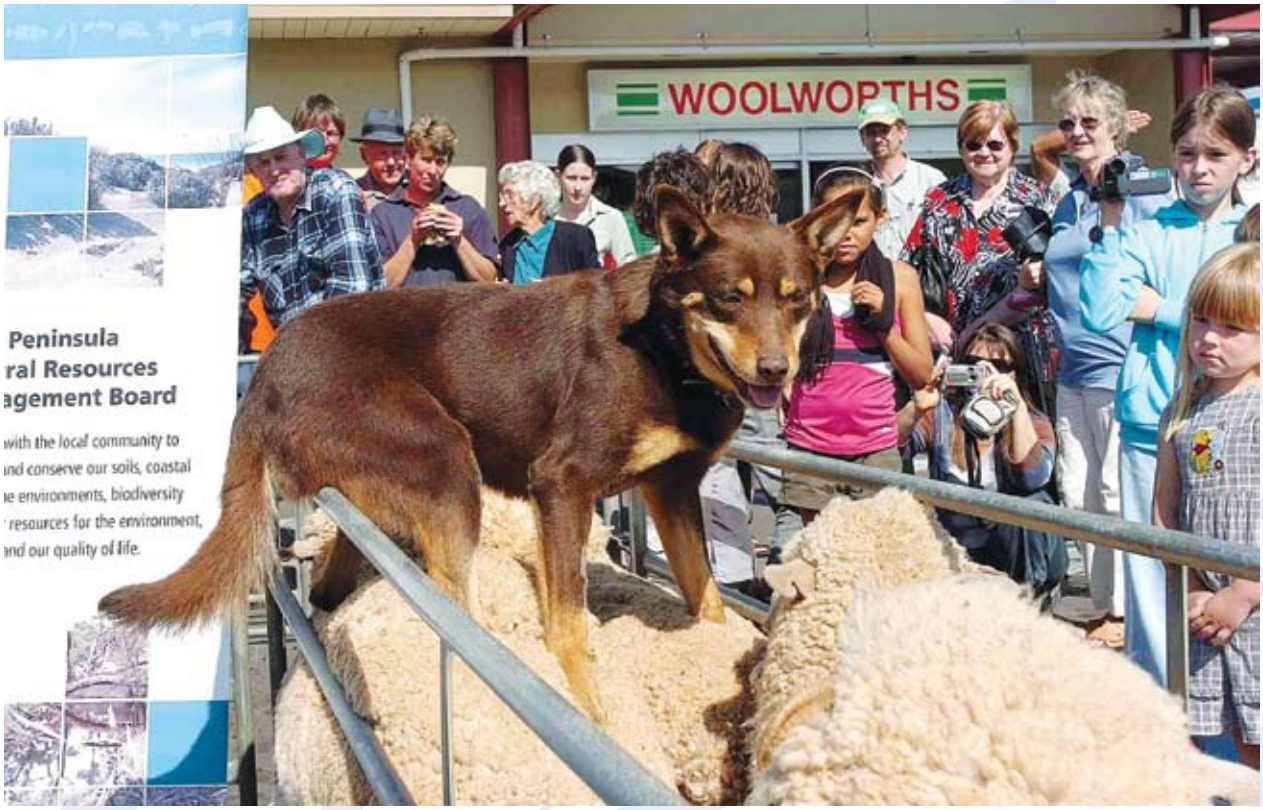
- Free food for thought, Grain & Graze Grazing winter crops roadshow workshop notes, 2008

  Website:
  www.landwaterwool.gov.au/products/pr081446

- Planned grazing management, Land Water and Wool, 2007

  Website: www.landwaterwool.gov.au



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Government of South Australia

Eyre Peninsula Natural Resources Management Board

Eyre Peninsula Natural Resources Management Board
PO Box 2916, Port Lincoln SA 5606 Phone (08) 8682 7555 Fax (08) 8682 5644
www.epnrm.sa.gov.au