AUSTRALIAN NUFFIELD FARMING

SCHOLARS ASSOCIATION

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2002 SCHOLARSHIP

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Topic: Sustainable Production & Grazing Methods in Arid Rangelands & Living with Regulation

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EXECUTIVE SUMMARY

NORTHERN Australia is renowned for its highly variable climate, characterised by short growing seasons, long dry seasons and those years when it's debatable whether there is a 'season' at all.

This poses a challenge to graziers, attempting to run ecologically *and* economically sustainable businesses. For many it involves guesswork as to production levels, too frequently cases of supplementary or substitute feeding, and the forced sale of livestock due to inadequate seasons. Those who fail to adjust stocking rates in response to conditions pay the price with land degradation, thus affecting later production levels and ultimately their bottom line.

Some progressive graziers in Northern Australia have begun adopting new methods of grazing, which have been introduced, (and modified where necessary) from Southern Africa. While rotational grazing has existed in varying forms in Australia for a long time, it has only been used on any scale in Northern Australia since the early 1990s. For each grazier who has carefully and successfully implemented any of the basic principles of the varying forms of holistic management, there has been another two, who ridicule the concept. The common perception: it may work elsewhere, but it won't work here.

I went to South Africa to assess the longer-term results of rotational grazing methods in arid country similar to my home. Now I believe land managers in arid rangelands can't afford ***not*** to apply many of the simple principles of holistic resource management, including rotational grazing and resting of production units, in some form or another.

During my scholarship, I also looked at increasing government regulation of natural resources management, and how farmers and graziers worldwide were coping with the pressure applied by conservation groups and the general public. This pressure, through new legislation, is surely at the expense of the landholder.

I saw examples of how ranchers, particularly in the United States have begun working with, and not against, their previous opponents towards common goals. There were cases where this appeared to be providing positive outcomes, although sacrifices had been made by landholders. But ultimately, there were a lot of common goals between both parties, and when they began working together, the understanding and rapport built defused a lot of anger and antagonism. I feel there is a developing viable market for managers, who want to specialise in optimum resource management.

While these two specific study topics provided me with invaluable material, it was the core tour of my scholarship that underlined the more fundamental issues affecting agriculture. Possibly the greatest realisation was that we operate in a ***commodity*** industry. The detail we invest in our produce is generally forgotten the minute it leaves our loading ramp. The few main players (namely the multi-national food companies) can source similar products from any given corner of the globe, and they do. Future plans for farming and grazing businesses should be made with the ongoing reality of low commodity prices, instead of hoping and waiting for 'holy grails'.

ACKNOWLEDGEMENTS

There can be no doubt that my wife Sally must be thanked first and foremost. My scholarship would not have been remotely possible without her encouragement, support and hard work, leading up to, and then during my trip. Sally did far more than just morally support me through this. She worked tirelessly from when I first uttered the word 'Nuffield', then during my absence, through to my return, in caring for our children, managing our business through one of the toughest years we have had, all while carrying a pregnancy. Thanks Sal!

Next I would like to thank Nuffield Australia for existing, to give individuals like myself this lifetime opportunity. Having now completed this scholarship, our world does not seem such a big place, and this knowledge alone is so relative to agriculture today. The range and calibre of people, from farmers to politicians to (bartenders) we were able to meet throughout the core tour, and the subsequent perspective this gave me on agriculture, alone made the whole thing worthwhile.

I would then like to thank Rabobank Australia, for investing their faith and finance in Nuffield Australia and in me - this is a testament to their faith in and partnership with Australian agriculture. Through their support it was possible to seek and learn more about something fundamental to the success of our business - sustainable rangeland management, and the regulation thereof. It is through the support of such institutions that agriculture in Australia will advance.

I am grateful to a long-time friend of mine, Neville Hunt, a land-commissioner within the Department of Natural Resources, who has been a great source of knowledge and information to me over the last twenty years, on the matters of land management, and the role government plays in administering and regulating it.

I would also like to thank Tony Mott, through whose enquiring mind and pioneering spirit my interest was first sparked to look at grazing/land management from a different angle. Thank you also to Terry and Pam McCosker, from Resource Consulting Services, for introducing me to some sound and indisputable principles for grazing management, and also for the great people they put me in touch with, in South Africa.

I would like to thank all my hosts, in the various countries I visited, who not only answered millions of questions, but who also took me in, almost as family, and whose hospitality and humour made me feel like I'd hardly left home.

Thank you also to all my extended family, friends and employees, without whose help and support I would not have been able to get away, nor come home with everything still in one piece.

Lastly I would like to thank my parents, John and Norah, who have given me an appreciation for life on the land, and a love of the land itself. Thank you also for the support you have given me in choosing to make a career of it.

AIMS, OBJECTIVES AND STUDY GOALS

My Nuffield Scholarship aim was to look around the globe, in regions with similar climatic conditions to home, and assess the long-term results of various rotational grazing methods. I hoped to compare these methods with other, including traditional, grazing practices. At home we had started implementing substantial changes to our grazing management practices with encouraging results, but I felt a visit to regions where these practices had been undertaken long term would provide better insight into how far we should go with it.

My intention was also to look for alternative animals, or breeds in the belief there were possibly animals better suited to the nutrition and climatic conditions of our home.

I also wanted to personally assess regulation of rangeland management in various parts of the world, and see how farmers globally were addressing the mounting pressure from the environmental movement, and the extra costs and limitations that go with it. I had observed over the years that ranchers in the United States had less freedom to move than we did in Australia, and thought they may have come up with some solutions for these problems.

During the core tour of my trip I realised there were possibly some 'bigger picture' or more fundamental issues affecting us in agriculture, than the issues above. While I didn't research them specifically, in this report I would like to touch on them. I don't have the answers, but an awareness of the issues should help me to structure our business to minimise the damage, and maximise the opportunities presented by this era of globalisation and cheap food.

INTRODUCTION

I have spent all but six years of my life in Northern Australia, and all my life involved in the grazing industry. Northern Australia, or the part where I have lived most, is renowned for its short growing seasons, long dry seasons and often-questionable seasons at all. Some days it seems I have spent the majority of my life watching clouds and waiting and hoping for rain.

For the majority of the last fifteen years I have been engaged primarily as a rural contractor erecting stockyards and fences throughout the vast tracts of Northwest Queensland, where I have become familiar with the myriad land-types and methods of management employed there. It would be fair to say I have seen the best to worst of the land and its guardians.

While my father made the hard decisions in times of failed 'wets' sooner rather than later, it seemed in my experience we faced a greater challenge than farmers in many other regions, in finding a way to manage through those less favourable and more variable seasons. During my years as a manager in my own right I found myself managing in a reactionary manner more often than I liked. I always hoped I could find a better way.

Some year ago I was speaking to a local grazier about different land types, methods of grazing and stocking rates, and he said he knew two years in advance what his stocking regime would be. This did not seem possible. How could this be, when you don't even know whether you will receive a wet next year?

This concept of proactive (versus 'reactionary') management had me intrigued, and to have this level of control and comfort with the future certainly appealed to me. He'd been adapting his grazing management to a style developed in South Africa, and was finding great success in it. It was some time before I learnt much more about it, as I found my way out of one mediocre season into the next.

More recently it became clear to me that the principles for grazing management still employed in even the harshest environments of Australia, basically hadn't developed or adjusted much from those used in the lushest and richest corners of the globe, where they originated. On the other hand it seemed some methods developed during last century in the dryer regions of South Africa, with varying degrees of success, were based on matching the management to the specific environment and its climatic conditions.

Certain individuals had observed the interaction between the land and the native (animal) inhabitants, and designed a system of grazing which attempted to simulate the natural growth and grazing patterns that existed there. While in this report I have focused mainly on grazing methods, it is important to note this ***holistic*** type of management covered the farming businesses in their entirety, considering all resources -grass, livestock, people and finance - in the decision making process.

In the meantime there was active debate as to why these 'new' methods may work elsewhere, but would or would not work here. We started slowly, by adopting some of the basic principles, and were happy with the results we were getting from the

outset. We were also encouraged by the results of others going down similar paths. But I was keen to see the longer-term results of these methods, and thought a visit to its country of origin would be invaluable.

My personal study trip took me to South Africa and the Southwest United States. A slight detour to my initial itinerary to attend the International Rangeland Congress in Durban, South Africa proved invaluable. This congress is a meeting/conference held every four years, bringing together scientists, farmers and government agents from around the world, to discuss progress in any research, fieldwork and practical management of rangelands. Rangelands account for more than eighty percent of the earth's land surface.

I thought the IRC would certainly provide some useful information and further contacts for me. In trying to get a better handle on regulation of rangeland management, I hoped that hearing what all the scientists were up to could give some insights as to where the regulation was headed.

SOME INSIGHTS INTO GRAZING MANAGEMENT

In South Africa, after attending the International Rangelands Congress in Durban, I made my way down to Port Elisabeth, hired a car and set off inland with a couple of contacts, and a little trepidation. Having been warned about the dangers of stopping for anyone and then seeing a man shot dead on the road between Durban and Port Elisabeth, I was a little anxious, yet keen to get out onto some grazing properties.

My first hosts Willie and Gill Pringle were excellent, taking me in almost as family, and set a tough act to follow by taking several days out of their time to show me around their farms, and introducing me to the basics of managing their sheep, cattle and goats in a fairly complex rotational grazing system comprising some two hundred paddocks.

One contact led to the next and I spent two weeks bouncing from here to there and covered near half the nation. The people I visited varied considerably in the environments they managed, and the methods they employed, however I was struck by their depth of knowledge of their respective farms and the intensity of their grazing management systems.

What nearly all these people had in common was tertiary education and overseas travel. I am not suggesting either are a prerequisite to good grazing management, however the attitude of continued learning fostered or developed through tertiary education has been missing to a large degree, in the grazing (agricultural) industry of northern Australia. This has changed somewhat in recent years, with the likes of the 'Grazing for Profit'/ 'Future Profit' type short courses offered by private and government consultants, which I think are instigating a sea-change of attitude towards general natural resource and business management.

My trip provided insight into the effectiveness of different methods of grazing management, and highlighted the need, and provided some opportunities, to maximise profits. These opportunities may enable greater sustainability, no matter what your grazing system.

I will not attempt to rewrite the book on slash-graze, crash-graze, cell-grazing, spell grazing, boom-bust, bite the dust, short duration of each rotation, or any other variation of grazing management, including the traditional set stocking methods. Rather, I will look at various aspects of some of these grazing methods I feel have potential to influence either their effectiveness or usability.

MAXIMUM UTILISATION OF ALL AVAILABLE RESOURCES

I have made my living as a beef-and-wool producer with a focus on the details of production. But my perception has changed acknowledging that the success of our business (profit and sustainability) ultimately depends on our ability to maximise the production and utilisation of grass.

In most other cropping operations it seems that managers focus and strive for higher production and yield, yet in many large-scale grazing operations the existing yield is

not being fully harvested (or utilised) anyway. So first steps first. It became clear to me that the initial step should be to begin fully utilising what we already have before investing time or money trying to produce more.

In many cases there is under-utilisation in one area, and gross over-utilisation in another all in the same paddock. This can be a simple matter of proximity to watering points, in uniform country, or on the other hand may be a factor of different land types, influencing favourable grazing areas. Once an area has been more heavily utilised for one reason or another, it seems that it becomes a perpetual cycle, the following season the grass is fresher there, (immature plants) and so it goes on. This is the worst thing for those immature plants, not necessarily having had adequate rest or time to rejuvenate or replenish root reserves for ongoing production.

The flipside is more mature; less favourable plants, possibly in another area of the paddock have more than adequate growing time, and go through to a moribund stage of growth, making them even less favourable.

Having watering points strategically placed to minimise walking distances to water or to fodder is possibly the simplest or most important step in achieving optimum utilisation. On vast properties, of marginal country this can seem daunting, with the ever increasing costs of development. However in most cases that I have seen, the economic benefits that go with the higher utilisation and animal production have outweighed the costs.

Noman Kroon, a very successful grazier from Graaf-Reinett, in the East Cape of South Africa, pointed out to me that the initial cost of some pretty significant development on his original two farms some thirty years ago was re-couped in the first year.

It has an almost snowball effect too, in that the previously under-utilised areas of paddocks, seem to rebound amazingly with not only much fresher, more palatable and nutritious fodder, but actually produce a lot more as well. The previously more favoured areas of a paddock then have their workload reduced, allowing them to reach adequate maturity and thus sustainability.

As mentioned earlier, variation of land type, while not the only factor, certainly has a big influence on what or where animals choose to graze. In a lot of cases it seems the Australian landscape has been divided up in squares for the sake of squares, with little regard for the topography or land-type. While it would not be economically prudent to demolish and re-erect internal fences on a single property in one move, within a normal renovation and improvement program it is possible to modify the existing property layout with minimal undue costs and significant benefits.

Another important point to consider in striving for maximum utilisation is the choice of animal. Quite obviously, a purebred Black Angus would be unsuitable for our farm at Kynuna, Northwest Queensland. You would be a lot closer to the mark with a Bos Indicus breed. However while a Brahman-cross cow may thrive through most seasons, her less mature progeny may not do as well in certain areas of the property. This brings to mind a grazier from near Bedford, South Africa, Lochart Ainsley, whose main focus is ‘maximum utilisation of all available resources’.

He runs a goat, sheep and cattle operation in country of fairly variant land-types, which runs up into high rainfall, high altitude mountain country. This higher country is covered predominantly with an almost pest-like, rapidly growing grass, which I think is called Simapoga, which is low in palatability. To put immature animals up into this country would kill them in a short time. Lochart gradually 'trains' them onto it, which he jokes involves covering his eyes when he checks them for the first little while, but has them eventually doing reasonably well on it, before gradually working them down onto better country for finishing. He refers to them while up in the top country as having their overalls on- effectively 'doing the job' for him in his less favourable country. In this backgrounding stage, albeit slow growth, they are effectively making good or near full use of country otherwise useless to other animals, with the exception of wildlife. At the same time they are improving that country, by the nature of Simapoga not responding well to grazing, while more favourable native plants are allowed to take hold.

Having spent their last season in his best pastures, these mature animals (six and seven year old bullocks) leave his farm in their 'sports coats' on their way to the supermarket!!

ADJUSTING STOCKING RATES (SELL'EM RATHER 'N SMELL'EM)

There are always variations to the rule; however for grazing enterprises in Northern Australia it has always seemed to me that a fairly static herd was the 'norm'. This 'one number fits all seasons' approach has sometimes been nearly sustainable, but only where very conservative stocking rates were applied. There were other managers who continually ate themselves into droughts and simply blamed it on lower than average seasons. One thing I have learnt well is not to expect an 'average season'- they come about one in ten and I tend to suspect that the reliance on 'averages' is probably the main culprit of many of our self made 'droughts'. In a region with highly variable rainfall I believe the stocking rate applied must also be highly variable.

To adjust your stocking rate on a continual basis can present a fair challenge, but these challenges are nothing compared to the costs of supplementary feeding through extended dry periods. These challenges are certainly less today with the luxuries of road or rail transport for livestock to nearly any corner of the state (or beyond). While this isn't cheap, it opens up options of premature marketing, or at worst, agisting stock on alternative country, so as to look after the pastures at home.

While in effect agistment is substitute feeding, which in most cases impacts significantly on the profitability of an enterprise, in some cases, for short periods, it can be a suitable option. In any case it must be better than keeping too many stock for too long a period at home, resulting in near permanent damage to pastures, and reduction to long-term production.

The first step in adjusting stocking rates to suit the available fodder resources is assessing how many head of stock need to be either added or removed from the property, on a seasonal basis. While there is a downside to the very short growing seasons and extremely long dry seasons in our region, I have come to see this as an advantage. Once our annual growing (wet) season has come and gone, at least we know what we are working with, for that particular year.

The age-old method of driving through the paddock, passing your eye across the feed and making subjective comments like "Gee, she's gonna be a bit tight this year!" or "Well, they won't even touch the sides of it, I reckon", or worse still "If you look real hard you can see a shoot in it there- but we better top up the molasses tanks", is probably not quite objective enough to help with making good decisions regarding stocking rate.

The cases of lost opportunities as far as buying extra stock, taking agistment on or even turning excess grass into hay, or worse still having to lighten off by forced sales of livestock late in the year with very unfavourable prices, makes the task of doing the feed-budgeting in a more fine-tuned manner very worthwhile. Trying to crudely calculate the number of stock-days available in a paddock, or across a property can at first seem almost impossible, but with a little tuition and practice, it becomes almost second nature. It seems that making an accurate, objective assessment will put you in a better decision-making position than just accepting the 'long-term average'.

While not wanting to push too much the line of subdividing paddocks or rotational grazing, I think it is worth noting a comment made by another South African grazier. Isaac Jocum, a cattleman from the Kimberly region who runs around 2500 cattle in a cell-grazing operation. Isaac quoted Allan Savory, an early proponent of cell grazing who said that "the cheapest form of drought feed is a fence." Isaac feels that his system of smaller paddocks, with short grazing periods effectively gives him a automatic warning trigger, as to how much feed or time he had available for the animals depastured there.

In a traditional grazing system, where you put the accepted number of stock in a paddock, the results of your estimate of available feed aren't really clear until late in the season, as the change in available fodder is over a long period, making it almost invisible. Alternatively putting the same mob in a smaller paddock will show you exactly what feed levels are available. In Isaac's system it may mean putting his nine hundred heifers through a group of twenty to thirty paddocks for say three to five days each. If they took out say one third of the available fodder from a given paddock in the initial graze period, he would know immediately that he could take out two more consecutive grazes with a similar sized herd, thus assuring him there was adequate feed there for this herd for say ten more months. And having run this course, if the stock came out of the last graze in fair condition, then there was probably another comfortable graze in the paddock without adversely affecting the pasture, thus giving him a fairly accurate method of planning ahead.

While Isaac spent the necessary time in assessing his country, and budgeting his feed out, he said this was a real simple method of knowing well in advance if and by how much his stocking rate needed adjusting. These views were similar to those of Norman Kroon, who believes not knowing when the drought will break is the most difficult aspect of drought management. Therefore, the next best thing was fairly accurately knowing how many livestock you could hold and for how long. With the smaller paddocks, and the help of good grazing records and experience, a lot of the guesswork and pain was taken out of farming (or managing) through droughts. (Norman Kroon, in a talk delivered at "Clovernook" field day, 2-03-93)

All in all I thought that the system of smaller paddocks and more frequent moves, while not everyone's 'cup of tea' certainly does keep the manager more in touch with the quantity, quality and health of their pasture, and ever aware of what effect the grazing behaviour of the animals was having on it.

THE RIGHT ANIMAL FOR THE JOB (DORPAS AIN'T DORPAS)

I covered this topic partly in the section on utilisation, in referring to Lochart Ainsley's use of mature bullocks to knock down the undesirable Simapoga grass, however I would like to discuss it a little further. In applying for my scholarship, I also hoped to look at alternative animals for our environment, specifically some South African sheep breeds.

My family and many others before us have been running merino sheep for wool growing purposes in northwest Queensland, with only limited degrees of success. Two of the biggest factors affecting the profitability of our enterprise were the low wool yields and the pathetic lambing percentages. Not to mention mediocre wool prices –a factor of profitability over which we never did and probably never will have much influence.

The fact that we were able to produce good, clean, medium micron wool, enticed us to continue with sheep, despite the downside. Shortly before my trip, I spent time with John Milton, an animal nutritionist (specialising in sheep) from Western Australia, who I would rate as one of the leaders in his field.

John was astounded we persevered with a sheep breeding enterprise when we weren't achieving a minimum 85 percent lambing. In his experience, you had to be getting that to be in the race. On consideration, why do we accept low rates with our sheep and not with our cattle? John suggested I look at some of the African breeds of sheep developed and actually thriving in harsh environments.

Before leaving I researched the Dohne merino, which is a meat sheep, with wool-growing attributes similar to our merino. However I was not able to find anyone growing them in regions as far north as us. I believed the heat we experience, and the low protein levels of our pasture were the most significant factors contributing to our low levels of animal performance, and therefore left them for the time being.

In South Africa I saw the Dumara and Dorpa breeds, and was impressed with their performance in fairly arid country. They are more of a meat sheep, and have the added benefit of actually shedding their wool without help. With wool prices hardly covering shearing costs, I thought this was a bit of a bonus. The Dorpa stood out to me as an animal that maintained incredible condition and reproduction rates in what was fairly low rainfall country. But I would investigate this further because while low, the rainfall seems more evenly spread out providing more even nutrition throughout the year. The desert type karoo bush (shrubs) these sheep lived on were typical for the tough environment, they in fact offered relatively high levels of protein, unlike our Mitchell grass in mid to late season.

In Phillipstown (near De Aar in South Africa) I crossed paths with a stock and station agent. Pierre was also a meat-sheep breeder who boasted having won the South African Grand-Champion Prize for a ram, which when slaughtered, dressed out at about eighty-five kilograms. I had to check he wasn't talking about a vealer steer!

Pierre made the point, and then showed me it would be foolish to just select a breed that seemed to offer what you were looking for on face value, while there was so much variation within those breeds. He showed me some subtle differences within the Dorpa breed making one animal suitable and another not in a particular region.

Isaac Jocum, mentioned earlier, was also big on having the right genetics for the chosen region. So much so that he took the unorthodox approach of breeding his own bulls, right there in his commercial herd. He simply carried out a process of elimination from when the calves were born to joining age then selected for adaptability and early maturity. Less attention was paid to looks, yet the progeny, as heifers or steers were as good as most I've seen.

He felt the best way of getting genetics suitable for your environment was to let them select themselves in the environment. Those not reaching a weaning weight in a certain time were immediately culled. Then those not showing the ability to grow out and finish early were also culled from the breeding pool. At the end of the day he felt too much focus and money was spent on genetics, which may not perform, or more importantly, whose progeny may not perform better than those he produced himself.

He quipped "they all have four stomachs, so stand back and let them show how well they perform" instead of being told what will or won't work! I found his views very thought provoking, however I still see a need to be bringing in fresh genetics, to avoid in-breeding and see purchasing bulls as the easiest way to achieving this. His reply: "if a seedstock producer uses the same genetics in a closed loop they refer to it as 'line-breeding', however if you do it yourself out on the ranch, it is denigrated as 'in-breeding'??!!

On the subject of trying to inject new or better genetics towards a continual herd improvement, Isaac reminded me of when Marylyn Monroe met Albert Einstein. Apparently she suggested they 'hook up', "You know Albert, with my looks and your brains, imagine the fine string of kids we could knock up."
Einstein thought for a moment before replying, "Marylyn, dear, it isn't as simple as that- they could end up with my looks and your brains!" Enough said.

STOCK DENSITY AND ANIMAL IMPACT (HOW MANY DEEP YOU STACK 'EM ON)

The topic of stock density will always cause debate, from the camp interested primarily in animal performance to those whose main focus is pasture performance, and almost all in between. It goes without saying an animal will do better, the more room it is given, through a wider choice of diet, and more of it.

However, selective grazing leaves a lot of plants untouched and others bitten frequently, leading to very uneven utilisation, and probably a lot lower gross production from the pasture. Over the course of a year, even with plenty of room, the animals' diet will ultimately decline, and from year to year the overall pasture health would decline too, thus reducing the diet quality for the animal, even at low stock density.

We must look back at the topic of 'Adjusting Stocking Rates' (matching stocking rate to carrying capacity) before going any further into the subject of Stock Density.
If we have our stock at too high a stock density across the board (in say a set stocking regime) then we would not be matching our stocking rate to our carrying capacity. It goes without saying the result would be a severe shortage or depletion of fodder before the next growing season. So the issue of stock density is more relevant to the various forms of rotational grazing.

There can be no doubt that the higher the stock density the lower the selection can be for the animal, through competition for feed. This will obviously result in more even utilisation, and probably a healthier pasture in the long run. This increased competition and lower selection has the potential to impinge on animal performance, however as Norm Kroon highlighted, if the length of the graze is minimised, the animals are moving on to fresh pasture every few days, effectively keeping them on a fairly high plane of nutrition.

Along with this the less palatable or desirable plants are eaten with the good, thus increasing the gross production or yield of the paddock. A citrus farmer, from Adelaide in the Eastern Cape of South Africa, challenged this view. This individual had spent many years as a research scientist at Fort Hare University working on assessing various grazing methods out in the field.

Jock Danckwerts had been conducting grazing trials over a nine to twelve year period in three separate locations, and said the results were the higher you 'stacked' them the less they would eat to the point the gross yield or production from a given paddock hardly rose at all, from the minute you went over the conservative stocking rate. Yet the animal performance dropped significantly enough that the net economic result was by far in favour of the conservative set stocking. He suggested the trials he conducted were over a long enough period, over a broad enough area, with a bias towards the rotational higher stocking rate if any bias at all, that the results were conclusive. I wouldn't for a minute deny the integrity of his findings; however, because of the dynamics and complexity of a good rotational system, as opposed to the simplicity of a conservative set stocking regime, and the fact that the rotation only involved six paddocks, I wondered if the rotation system was given a fair trial??

I think it is best to tackle this one step at a time, by looking at paddock or pasture performance first then coming back to animal performance later, then trying to balance the two. As mentioned earlier, the higher the density, the lower the selection by the animal, thus more even utilisation. Fred Provenza (Dr. Frederick.D.Provenza) highlighted this point during his two-day workshop on Animal Behaviour that I attended at the International Rangelands Congress in Durban.

Fred is a professor of range science specialising in animal behaviour at the Utah State University in the United States. He drew attention to the way animals behaved in a particular form of high-density grazing, that he referred to as 'Boom-bust' grazing. He noted that in this high stock-density system, practised by Ray Bannister, a cattle rancher from eastern Montana, the animals tended to or learned to 'mix the best with the rest' rather than 'eat the best and leave the rest'.

Fred conceded while in the early stages of such a system animal performance suffered, but once stock adjusted they rebounded to the higher performance experienced with low density grazing, and pasture was in front, through good seasons and drought.

I found it to be a commonly held belief of most graziers globally that soil disturbance provided by animal impact (as long as it is only periodic) is a contributing factor to healthy pasture in arid rangeland. Mineral recycling is increased through deposit and absorption of dung and urine, soil capping is broken by hoof action, and mulching of available litter is also improved through the hoof action.

It is an obvious conclusion then that the higher the number of stock in a given area (higher stock density) at a particular time, the higher the benefit of disturbance. While in the United States I spent time with a Nevada rancher who also worked commercially reclaiming former mine land. Tony and Jerry Tipton have achieved fairly impressive results in revegetating overburden and processed soil where apparent mineral and chemical levels would theoretically prevent anything from growing at all.

Their method involves high stock density grazing by feeding cattle in concentrated areas of their project area. The hoof action, dung and urine deposit, seed distribution and subsequent rest from grazing all play their part in achieving in some cases waist-high grass in the first year! All of this has been done in the region of Death Valley where the average annual rainfall is 'below five inches and it has been joked that the cattle need to be cross-bred with mustangs so they are fast enough to get from one grass plant to the next before they starve to death.' (Dan Dagget, "Beyond The Rangelands Conflict", p94.)

In a book I was given while in the States, the author Dan Dagget also talks about stock density when describing the results achieved in a trial site near Flagstaff, Arizona. Here the trial area is loaded with cattle at a density of about twenty-six times the accepted stocking rate, but only for short periods. The results of this unusually high animal impact, given the required rest afterwards, is plant spacings remaining as favourable in the trial plot as in a control plot, but the vitality of the plants in the trial area improved considerably in comparison to the control area.

Norman Kroon also pointed out to me the benefits of animal impact. Norm began implementing the principles of cell grazing some thirty years ago with sheep, cattle and goats on his three properties which have annual rainfalls of seven, twelve and twenty three inches. In a rotational system that has (from memory) paddocks of about 40 acres, Norm has found that if the pasture over time is losing vitality, he simply temporarily subdivides it into minute paddocks (strip) grazes large numbers for short periods. The energy generated from this type of disturbance on an infrequent basis seems to bring it all back into gear for seasons to come. This application of extremely high density grazing for short periods, on an infrequent basis was just one of the many tools Norm applied.

PADDOCK SIZE (IF IT TAKES ALL DAY TO GET HOME FROM THE BACK OF THE PADDOCK, YOUR TRUCK'S TOO SLOW)

A few years ago, prior to doing any subdivision of paddocks at home, I was discussing the merits of doing so, with a local grazier. He sounded dubious about it until I mentioned that the paddock I proposed to split in half was in fact twenty-five thousand acres. He literally cringed when I said this, then quickly replied, "Oh, Gawd, don't ever split up a small paddock like that!!"

What he has always tried to do is give his cattle plenty of room and leave them to their own devices to survive, and indeed thrive. Some of the healthiest, fattest bullocks I have seen have come out of those larger blocks of hilly country around Middleton.

As I got further into it I thought that the smaller the paddock the better, within reason, and this also seemed to be par for the course in South Africa. When I say small I mean anything from forty to four hundred acres. It seemed reducing size gives the manager much more control over each part of his property. It is with smaller such paddocks that higher stock density, animal impact and disturbance, shorter duration grazes and longer rest periods can be achieved. In low rainfall, long dry season country, all of the above seem to be important.

However, it must be remembered with smaller paddocks and higher stock densities the dynamics of management certainly change. The grazing period must be reduced with the relatively larger herds, and this not only raises the intensity of the operation, it increases the need to understand animal behaviour at a different level. Depending on the size and intensity of the operation, a property, which had mobs of stock being gathered from a paddock once or twice a year, may end up doing it on a weekly or even daily basis.

GRAZE PERIOD (HOW LONG YOU LEAVE 'EM IN THE PADDOCK??)

Discussing the length (of time) of a graze is probably putting the cart before the horse, as in most cases or methods of grazing, the time you choose to leave stock in a paddock is really a factor of how long you don't want them in there for. What I am referring to here is the time necessary for the pasture to adequately recover or re-grow from the previous graze. This is commonly referred to as the rest period, and I will discuss it later.

Consideration must be given to your focus: animal or pasture performance. The less time livestock stay in a given paddock, the less into the barrel they would have to stoop and thus they will maintain a higher plane of nutrition. In a fully-blown intensive rotation system, with the animals trained to actively compete for diet quality, there would be no time wasted from the minute they first hit the pasture of a new paddock to seek out the better grazing. However, in a less intensive system, I suspect that animals may need slightly longer to adjust to the new environment.

Thought must also be given to what the rate of growth is at the time of graze. If it is during the growing season, then it is fairly accepted that a desirable plant is likely to have been bitten twice within a two-week period if stock have access to it. What can happen to immature plants is that once bitten, they draw heavily on root reserves to continue growing, and if bitten again and again, will effectively use up all root reserves and die. So attention must be paid not to overstay your welcome in a paddock, or at least manage it with the youngest, most desirable plants in mind. In the drier period of the year when plant growth is slower or they become dormant, the duration of graze period is possibly not as critical. As the growth rate slows, in turn the necessary time for plants to recover also lengthens, effectively demanding stock stay in each paddock longer, increasing the overall time from when they vacate a particular paddock to when they return to it having done a circuit of other paddocks in rotation.

Norm Kroon reminded me of the need, in drought prone regions to implement strategies or grazing methods, to minimise the impact of those inevitable droughts. While in many cases it is common to see all gates opened to let livestock fend for themselves, Norm does the opposite by grouping into as few mobs as possible. What this does is give all the country a longer rest from grazing, but also has the livestock moving on to new paddocks on a more frequent basis, thus keeping their plane of nutrition as high as possible.

ANIMAL PERFORMANCE (CATTLE WEARING OVERALLS OR SPORTS COATS)

Lochart Ainsley informed me during the growing season he compressed herds, and rotated them through many paddocks, giving most country ample time to grass up, and with the higher nutrition available during the growing season, not compromising too much on animal performance. Then as the season turned, and they went in to winter, a period of dormancy, he segregated the different classes of stock, and spread them out in smaller mobs through more paddocks, albeit still in rotation, so as to give them more room and higher selection of diet.

Then before the next growing season he did a round with his mature animals, to clean up the pastures, which in effect had been unevenly utilised through the thinning out of stock during winter. This once again highlights Lochart's use of mature animals to do a job for him that younger animals would not handle. I felt that his were fairly effective methods of balancing pasture performance with animal performance.

In South Africa it seemed there were varying degrees of adherence to whatever rules or principles were in existence, however I say this in ignorance as due to limited time with each farmer I didn't go into all the details of each method. I suspect in general with many farms having up to 200 paddocks, the flexibility afforded was used to switch and change as the situation demanded.

Isaac Jocum suggested to me the benefits of rotating between paddocks of varying land and pasture type on an alternating basis, so as to afford all the livestock something closer to the variety of feed they would avail themselves in an unfenced situation. No matter how much we attempt to understand and try to provide for them what will deliver higher performance, we cannot fully grasp what is going on in their heads or their stomachs. While the idea of alternating may sound simple enough, in our regime of splitting up land according to land-types, for practical reasons, I probably would not have thought of this.

ANIMAL HEALTH (AND ALTERNATE HEALTH TREATMENTS)

In looking at animal performance, specific animal health issues need to be considered, in different regions. I was interested in some of the alternative treatments I saw for various animal health problems.

Norm Kroon uses an aloe-based paste to drench his animals for control of internal parasites. I wasn't there when they actually harvested the aloe-vera plants, which grow there, but saw his employees drenching his sheep and goats, which are run together. No doubt the harvesting is a labor-intensive job, but in South Africa where the wages are low, it makes economic sense. In a world where customer demand for organic based food is rising, I thought this was a good alternative to chemical treatments. Willie Pringle pointed out to me that the aloe plants were eaten from time to time in the field, suggesting that perhaps the animals were seeking the prescription themselves, so to speak.

Sandy Speedy, a cattleman from near Vryberg (South Africa), had an imaginative method of controlling ticks on his cattle. He runs a group of about twenty to thirty chooks with each large mob of cattle, and they literally peck the cattle clean on a daily basis. With the predators in the area, there is a need to pen the chooks on a nightly basis, however with someone out checking or moving the cattle daily, Sandy says this isn't a problem. Sandy stated that the saving in lower or non-existent dipping costs covers any cost associated with the chooks. These small numbers of chooks keep mobs of five hundred to a thousand cattle all but tick free. This method also minimises or does away with the need to apply chemicals.

Isaac Jocum's preference for heifers over steers in a growing enterprise was also based on (among other things) a heifer's inbuilt hormonal growth agent, oestrogen. Isaac made the point that while male cattle also have testosterone, which helps with promoting growth, we rid them of that by castration, to then turn around and whack a plug in their ear (HGP pellet), which is oestrogen, to help them grow faster. He said that he achieves better growth rates from his heifers consistently without either the cost or marketing handicaps experienced with treated male cattle. An interesting point!

BIODIVERSITY

As land-managers, we are generally improving our knowledge of managing the environment. To do so can result in improved profitability. Another incentive to do this is being driven by a demand from the general public, domestically and locally. Better management of the environment can entail greater biodiversity within our respective environment.

We know animal performance improves when an animal has a wider choice of diet. So too the plants within that environment, thus pasture performance, is influenced by the different animals that are grazed there. In a monoculture it would be possible to find the animal suited to the plant and manage it accordingly. However in most ecosystems the various shrubs, grasses, herbages etc, available can *cater for* and actually *thrive* from the interaction or grazing of various animals.

Willie Pringle's aggregation of farms at "Fairholt", run sheep, cattle and goats, not to mention the very diverse game animals that seem to flourish on his land that ranges from arid, shrub infested valleys to higher rainfall, well grassed rolling mountaintops. These farms are divided into hundreds of paddocks, where varying lengths of grazing by sheep, cattle or goats, are applied at strategic times to maximise both animal and pasture performance.

The wildlife is also controlled, yet not eradicated from their farms. In South Africa and America, commercial game hunting is an enterprise they benefit from. Not only does it help to control animal population, but adds a welcome stream of cash flow to the business. I was lucky enough to do a morning's hunting with Lochart Ainsley, and a few paying guests, the morning Australia knocked them over in the tri-nation rugby series! (I think).

It makes sense the wildebeest, kudu, fallow-deer and myriad other game native to Africa should be allowed to remain, at controlled levels, in their environment, helping to maintain the biodiversity and at the same time are harvested commercially to help with the cost of managing the environment.

A parallel can be drawn with the prolific kangaroo population of northern Australia. The kangaroo has a place in the Australian landscape, or it would not have been here in the first place, however their population today, with all the man-made waters, is obviously out of control. While commercial harvesting is controlling them, I feel the whole industry, of growing, harvesting and processing kangaroos is a very disjointed mess. If we, the grower could begin to view, and manage the kangaroo population, as a valuable resource, then we could possibly improve the whole situation.

CONTROLLING SCRUB ENCROACHMENT

It seems Queensland is not the only corner of the globe where scrub encroachment is an issue. In South Africa it was a common problem, for which there were various methods of control. One of the most common was fire. While this is not a new method, its use in northern Australia (to my knowledge) has been limited more to controlling regrowth of mechanically cleared scrub, or for encouraging fresh, more palatable growth of grass species such as Spinifex.

In South Africa I saw where it is used on a regular basis, to keep the canopy of the notorious Acacia Karoo and other acacia shrubs up, so grass can grow beneath. It is also used in open grasslands on a regular basis, to help maintain healthy pastures. Its use in controlling the spread of the acacia bush was most clearly illustrated by the field trials at Fort Hare University, which a range scientist of world renown, Winston Trollope, has been conducting for many years.

Winston asked us to join him while he 'did a burn' in one of his many trial plots. It was the thirty second time in thirty three years that he had burned this one or two acre plot, which highlighted his 'pyromaniacal' nature! He explained this was more regular than necessary, but it was a teaching device. He went to great lengths to explain the characteristics of different types of fires and how they behaved. He made clear the importance of understanding these differences to know what sort of, and when a fire should be applied to get specific results.

After the 'burn' he showed us through other plots, where varying combinations of treatments, including fire, fire and grazing (with various animals), and also no fires, and/or no grazing had been applied over the last thirty years. The results were graphic to say the least. The plots where no fires or no grazing or fires had been present had reverted to an infested mess of invasive acacia that was literally useless.

Winston also took us out to "Glen-Gregor", Lochart Ainsley's farm, where he has helped with controlled burns of a practical nature in the field. Lochart said this type of fire control was a prerequisite to good veld (range) management. The difference in pasture health from fire controlled paddocks, and others not so controlled was obvious.

Sandy Speedy, of 'cows with chooks' infamy also pointed out his control of woody weed invasion. Standing next to his cattle yards is an old D-8 bulldozer which hasn't turned a track for some time, and which he is trying to sell. Where once he tried primarily to control scrub encroachment with machinery, and lots of diesel, he now opts for the easier, cheaper, more effective method of high animal impact through intense grazing, and I think, fire.

Norman Kroon, from Graaf-Reinett on the other hand opted to try and control the encroachment of a resinous woody weed, up on his plateau mountaintop country, with intense grazing and then rest, and did away with the long-term practice of burning. He found within a short period of cell-grazing management, that the pasture grassed right up to and beneath the woody shrubs, effectively choking out, and in some cases killing the invader.

While these various forms of scrub encroachment control are very effective, it must be recognised that where fire (and possibly optimum grazing methods) have been missing from parts of the Australian landscape for some time, the encroachment has got away. In this case there would possibly be no other option but to employ mechanical methods to knock country back into a manageable healthier state. (Bring on the bulldozers and chain!)

VIRTUAL FENCES ('OUT THERE' FENCING - WITHOUT WIRE)

During the many years I have strung out new wires across the landscape in an attempt to control the movement of stock, my mind has often wandered in efforts to find an 'easier way'. I have for a long time entertained the idea of containing stock by some means of sonar or infrared wave. Sounds a bit 'out there' I suppose. I have more recently settled for single strand, suspension type, electric fences, which are proving very effective.

What I came across at Las Cruces, New Mexico, really captured my interest. Dean Anderson, a researcher in Animal Science has been working for some time on controlling cattle movement by way of G.P.S. (Global Positioning System) devices being fitted to individual animals. Dean, nicknamed "the cyber-cow whisperer" has been testing these devices in the field for some time, and is in the process of refining the prototypes for commercial marketing.

The solar-powered GPS devices are coupled to a microchip that has a predetermined physical boundary programmed into it, and then strapped to the cow's neck and shoulders. The GPS supplies the microchip with the cow's location, and as the cow moves close to the preset boundary, the microchip then sets off a noise device in either of the cow's ears, to deflect the animal away from the virtual fence. If the animal fails to respond to the increasing noise, small electric pulses are sent through the animal, in gentle persuasion for the animal to remain within the 'paddock'.

Based on the results of field trials I was shown the devices seemed to be very effective and Dean suggested once refined, these devices might become as small as simple ear tags. He feels that it may only be necessary to affix them to one in three animals, owing to the behaviour of animals to 'follow the leader'. With the devices being removable, their cost may be a one-off deal, thus making them more affordable.

On face value it looked a bit way-out, but we only need to think back 20 years or so to realise ideas we once thought absurd, we now take for granted. It reminds me of various times during the core tour of my scholarship, when we may have been travelling along in our rent-a-van, in a far flung country like France or Canada. Peter Best, a fellow scholar, would be perched up in the back with his wireless connection between his laptop computer and his mobile phone, downloading real-time reports of milk-yields of individual cows in his (500?) cow Gippsland dairy, and simultaneously sending instructions of alterations to particular cow's rations back! Incredible technology!

CONCLUSIONS ON GRAZING MANAGEMENT

If I set out to assess cell grazing as to its application and effectiveness at home, I would have found plenty of evidence to jump right in and adopt all the principles the method encompasses. Such is it if you want something to work or want to believe in something, then you will find all the necessary evidence to justify it (self fulfilling prophesy). This is not to suggest for a minute that any of the success stories of cell-grazing's adoption have been biased or fabricated.

Having now looked closely at various methods, and their longer-term results, I still feel the methods and basic principles of cell grazing in its varying levels of intensity are almost flawless. With careful implementation and adherence to those principles it certainly provides one of the best types of management systems I have seen. The crux of the matter lays in the level of intensity a particular manager chooses to adopt, and for that matter the lifestyle he/she chooses.

As an 'old hand' and rancher from Capitan, New Mexico, Sid Goodloe pointed out to me, permanent, set-stocking is a management practice devised in and for the regions of England, Ireland and other parts of Europe, where our predecessors came from. These practices transplanted reasonably well into the first settled regions of North America and Australia, being temperate, higher rainfall regions. But it has become increasingly obvious static herds and permanent stocking may only be suitable for those regions enjoying the comforts of higher, less variable and more evenly distributed rainfall.

Sid believes in regions such as his in New Mexico, and ours in Northern Australia, where he has also worked, where very variable, low rainfall and long dry seasons are normal, it is imperative we shake off the paradigms and management practices of our forefathers. Opting for methods developed for specific environments, such as the short-duration grazing systems used in South Africa.

While there are immense benefits in improving the health and given turnover of an area of land, thus improving profit, the flipside is the capital necessary to achieve this, or alternatively investing in more land to increase turnover, and at the same time increasing profits through the capital gain on the extra land. It is debateable how much (extra) capital gain can be achieved through proven higher stocking rates of any particular land, if indeed those higher stocking rates are only achievable or sustainable through the continuation of a more intense grazing regime.

This starts to sound rather ambiguous, and I suppose the answer lies therein - there is no right way. At the end of the day it comes down to the individual, and how they want to do things. As long as they are monitoring and measuring and recording the effects of their chosen management, and adjusting according to what they see, in the health of their land and their bottom line, then they will be better off than if they just kept on keeping on.

LIVING WITH REGULATION – AN INSIGHT FROM USA

Environment and the regulation thereof was a big issue across the world, even before I left home. In all the countries we visited it came up in nearly every meeting, mainly because governments universally have put it near top of the agenda. My hope before leaving home was to find where and how farmers were coping with the extra pressure the general public, through government regulation and lobby groups, is applying to their businesses.

In the southwest United States where I went to look at environmental regulation and relationships between ranchers, government agents and environmental groups, the main issues I saw were stocking rates, and endangered species.

With regard to stocking rates, there has been a long raging 'war' as to whether livestock, (in particular cattle) should be allowed to graze on rangelands at all. The green groups have concentrated mainly on public lands, which are leased to ranchers, in a similar manner to the Australian leasehold system. This controversy was highlighted by the massive campaign run some years ago, "Cattle Free in '93". This campaign is still going strong, but most ranchers have been able to keep their allotments, albeit with strict guidelines as to livestock numbers and the times of year they can utilise this land.

In many places there seemed to be ongoing antagonism between the ranchers and government agents and the apparent rigidity of rules and 'police state' mentality government agents have adopted seemed to be a contributing factor to the ongoing controversy. In one place I was even told of how two Bureau of Land Management agents had been shot dead in their camp some years earlier, over a long running dispute. While this example is not common and involved highly irrational behaviour, it highlights a system that is clearly not working well.

Some ranchers also have an attitude of "why should we be told what we can and can't do when we have been doing it for generations". As in Australia, the general public is applying closer scrutiny to how ranchers are operating and whether this is fair or justified or not, the rancher has to accept compliance is compulsory.

What I observed in various states was where a holistic approach to ranching had been taken, especially if done in groups or in a collaborative manner, with some publicity about how they were doing it, the level of friction and regulation seemed to drop. This successful strategy underlined the need to, and benefits of publicising what you were doing and the positive results to the general community. It seems while the general public have identified themselves as 'major stakeholders' in the domain of environmental management, they don't contribute much in attempting to reach their desired outcomes. Therefore as the responsibility is left in the rancher's hands, they simply need to highlight their positive performance, through publicity, to keep the public pacified.

RANCHERS USING PUBLICITY TO THEIR ADVANTAGE

A good example of this was a booklet put out by the California Cattleman's Association in collaboration with the United States Department of Agriculture, titled "Grazing for Change- *Range and Watershed Management Success Stories in California"*. This booklet is a heartening compilation profiling a number of ranchers who adopted a fresh holistic approach to ranching and who are achieving rewarding results.

In the foreword, Dan Dagget draws attention to the fact without ranchers doing what they can do well - manage the environment - simply removing them from the equation, with the commonly held perception the environment will revert to something "natural", the general public may be misleading themselves completely.

He also tells how, when the messages from books like this are shared with the main adversaries to ranching, the results are positive. What is important to note is the scepticism of vegetarians and preservationists remains, until they are shown photos and records of the ranchers' achievements. They are generally surprised ranchers can do a good job and are already delivering outcomes they so stridently want..

Their remarks of "I never knew anything like this was happening", "It's just the opposite to what we've been told", and "These people should be commended, how can I help?" highlights the obvious need and the severe shortage of publicity that booklets like this give, positively underlining the efforts commercial farmers are making towards a sustainable environment. As Dan Dagget said, "If that's not a bridge waiting to be built, I don't know what is".

BREAKING DOWN THE BARRIERS - GETTING TOGETHER TO ACHIEVE COMMON GOALS

While in New Mexico I was honoured to attend the wedding of a ranching consultant who advises on holistic resource management. Kirk Gadzia and his wife Tamara happened to be friends of one of my hosts in South Africa, and also the people I was with in New Mexico, and I was asked to come along. It was a great opportunity to experience the local southwestern culture and hospitality, and to be present at a gathering of ranchers, environmentalists, consultants and scientists alike, all in the one room, and all good friends.

At the wedding I met some of the founders and members of an interesting organization called "The Quivira Coalition", which is based in Santa Fe, New Mexico. 'The word 'quivira' was used by mapmakers during the Spanish colonial era to designate unknown territory beyond the frontier. It was also a term for an elusive golden dream.

The Quivira Coalition is a non-profit organization incorporated in New Mexico on 11 June 1997 by two conservationists and a rancher. Its purpose is to teach ranchers, environmentalists, public land managers, and other members of the public that ecologically healthy rangeland and economically robust ranches can be compatible. Quivira's mission is to define the core issues of the grazing conflict and to articulate

a new position based on common interests and common sense. They call this position the ***New Ranch***.

They pursue their educational mission through a regular newsletter, workshops, conferences, lectures, site tours, a Web page, seminars, outdoor classrooms, publications, videos, collaborative management demonstration projects, monitoring, and scientific research.' (Quivira Coalition Website, as viewed on 8-3-04).

Over time the founders realised the longstanding conflict and antagonism between ranchers, 'conservationists' and government agents was not helping anyone progress towards what they identified as common goals of all groups i.e. practical, innovative, and collaborative solutions to complex natural resource issues in the West. (The Quivira Coalition, 2003, "Forging a West that Works").

The later publication profiles pressing issues in rangeland management, and individuals, including scientists and ranchers, who offer opinions on and solutions to those issues. The details of those solutions aren't necessarily always agreed upon, however are there to inspire, teach and provoke those who read them. The contributors to the book don't offer "silver bullets" to the myriad problems their region faces, but more importantly encourages looking, learning, listening and changing - where change is necessary (T.Q.C., 2003, Forging a West That Works).

The founders have shown how breaking down barriers between various interest groups, has augmented this organization, which is itself a shining example of what can be achieved if people take a step back to constructively work towards common goals.

BEYOND THE RANGELAND CONFLICT

I have mentioned and quoted from the book "Beyond the Rangeland Conflict", by Dan Dagget, but would like to draw special attention to it. Environmental regulation puts pressure on farmers, and solutions for coping was one of the main focuses of my scholarship, so I was pleased to come across this very informative and positive book. It has renewed my hope that graziers and land managers in Australia will be able to do as some ranchers in the United States are doing i.e. burying the hatchet and realising that they, as well as the scientists and environmentalists, have a lot to learn, and can in fact help each other in that quest.

Robert. M. Miller, a columnist for Western Horseman made the valid observation: "Grasslands must be grazed, or they become something other than grasslands. Ranchers and environmentalists have far more compatible goals than they do with many other would-be users of our rangelands. *Beyond the Rangeland Conflict* succinctly describes those goals and gives vivid examples where the concerned and reasonable people have successfully cooperated to improve and preserve our grazing lands." I couldn't agree more with this observation and would recommend the book to anyone involved or interested in the rangeland debate.

ENDANGERED SPECIES

I didn't go into the intricate details of this issue; however it came up again and again when I was in the United States. With increasing demand for water from urban development, the waterways were being targeted, or at least closely scrutinised by environmental groups. Grazing lands were not exempt from the 'heat' and ranchers were in some cases being pressured to vacate permitted grazing allotments their family had used and cared for, for over a century.

Kelly and Steve Wooster, ranchers from Copperopolis, California, told me of the ongoing pressure to get them off a mountain allotment in the Sierra foothills. The environmental groups are suggesting cattle are causing the extinction of a particular little frog (or toad) found in that area. The 'greenies' fail to accept that cattle, and their grazing action, when managed, actually stimulates a healthier ecosystem, rather than denigrating it, as is suggested.

Kelly, who has practised law for several decades, suggests a lot of the problems rancher's face with the endangered species act, could have been prevented if government was more responsible with its policy formulation some twenty or thirty years ago. Because of certain peculiarities (and possible loopholes) in the legislation, government is now being held ransom, by radical pressure groups. The result, effectively, is government is forced to implement steeper regulation on ranchers, or face massive lawsuits filed by the 'greenies'. In effect the government created the noose, which it then very conveniently sidesteps, then places over the rancher's head.

I thought it was worth considering if governments weren't so focused on short-term solutions to problems, and took a responsible, long-term approach to new legislation, then half the disputes and antagonism could be avoided.

INTERNATIONAL RANGELANDS CONGRESS

I left the core tour two days early to make my way to Durban, South Africa, to attend The International Rangelands Congress in late July 2003. The congress presented a smorgasbord of workshops, lectures, presentations and debates on almost every issue and recent development in the field of rangeland management. I only wish our car had not been broken into while in New Zealand, as all the information I had on the congress, which I was still using to organise my time there, was lost. In the end I had to basically choose on the spot which seminars or workshops I attended.

As mentioned earlier, I enjoyed immensely a workshop conducted by Fred Provenza, on Animal Behaviour Principles, which had a fairly practical approach. There were other interesting lectures and presentations given, but on the whole, I got the impression the scientific fraternity was too wrapped up in the details of their specific field of interest to 'see the wood through the trees' with regard to economically sustainable, commercial management of the rangeland to which they so passionately dedicate their careers - as do the commercial graziers. It was a scientist there who introduced me to the term "Reductionist Science". Apparently it is the practise of learning more and more about less and less, until you know everything about nothing!! As highlighted at the conference, somewhere near eighty-five percent of the earths land surface is taken up with rangeland, and I was surprised more time is not dedicated to looking at economically sustainable solutions for practical, commercial managers of that environment.

One particular presentation did highlight the fact that ecologists (and range scientists) focus mainly on bio-geo-physical relationships, leaving humans "separate" from nature. The presenter suggested little consideration was given to the economic impact of "protecting" natural resources. On the other hand economists are more concerned about making money, and they generally show less concern to 'downstream' or subsequent users with the attitude resources can be replaced or substituted.

The presenter suggested the two schools of thought were beginning to converge, but with limited understanding or knowledge of the technicalities of the other's field. Once again it emphasised a need to manage business, and the environment in an holistic manner, taking into account balance between the environment, people, and economics.

I thought it useful for scientists and farmers/graziers alike, to reflect on an ideology I came across at this conference. It suggested that **conservation** is for most resources, simply a **strategy** for *optimal use*, and **does not** mean a permanent commitment to *minimal use*.

I did find there was increasing referral to satellite imagery, and space technology and its use as a tool to monitor the state of rangelands. I believe its use will increase. While many land managers are threatened by the 'big brother watching' attitude, if used properly, it presents a brilliant monitoring method for managers. At the end of the day, it also means that we better keep our socks pulled up.

THE 'BIG PICTURE' ISSUES FACING FARMERS

What I got from the individual study tour of my scholarship was all I had hoped for, and then a little bit more. Invaluable knowledge was gained from the many individuals who hosted me, to whom I will be forever indebted. This tour certainly broadened my understanding of rangeland and grazing management, and boosted my confidence in managing in an environment renowned for its climatic uncertainty.

It was however the core tour of my scholarship, which served as the 'reality check'. While my individual study provided me with some answers, the core tour really left me with more questions, to which I still wonder if there are any simple answers. I will highlight some of the fundamental macro-issues I observed, which I feel have greater potential to affect our farming businesses than the smaller production oriented micro-issues I have addressed at length.

GLOBALISATION – IT'S GOOD, BAD, AND UGLY

The world has effectively shrunken in size dramatically over the last hundred years. Whereas once the concept of transporting food (agriculture's main reason for existence) was a tedious and almost non-existent practise, today food is moved from one continent to another on a daily basis. It is possible for a farm in northwest Queensland to put fresh crayfish on the plate of a discerning customer in downtown Tokyo, virtually the next day.

Beef-producers in northern Australia are well aware of the advantages of globalisation with the live-export trade of cattle to Southeast Asia and the Middle-East underpinning, or at least supporting other market alternatives.

The flipside to the benefits of market access and opportunity are many. We are now at the mercy of foreign currency exchange rates. A slight strengthening of the Australian dollar against other currencies can cause significant swings in our local commodity prices.

Certain trade benefits through greater market access for one sector can cost other sectors dearly, as seen with recent developments in the free trade agreement between Australia and the United States. Compliance with regulations on food safety and quarantines are hurdles, which apparently are used as much for trade barriers, as for what they are supposedly intended.

Ultimately if the world was a level playing field, then the opportunities presented by transport advances and foreign markets would put Australia in the box seat. Our primary advantage: being able to produce cheap, clean food in an efficient manner.

Yet with globalisation comes huge multi-national companies. The ease and freedom to produce and transport food commodities around the world has given these commercial giants an unprecedented capacity to control the prices on a global scale.

An example of the power these huge food companies exert can be seen in their ability to control commodity prices in the dairy industry. One food-chain supposedly

there to provide benefits for its suppliers (actual members) by way of a cooperative was while making record profits, delivering decreasing farm-gate prices to suppliers. The particular co-op smugly informed us of their growing global market-share, rapidly rising profits and close ties with other huge food companies. So in effect there were a more secure organisation, but it wasn't helping the farmer. Obviously, there were subtleties in this scenario I was unaware of, but my impression was the farmer was basically there for someone else to make money from.

FOOD – THEY ALL WANT IT, AT EVERDAY LOW PRICES

Cheap food = Low Commodity Prices

Everywhere we went it was made clear, if we didn't know it already, agriculture needed to deliver cheap, safe, environmentally friendly food. It was suggested the average customer in any supermarket of the developed world was partial to 'feel-good' type products boasting organic or environmentally friendly methods of production, but ultimately it was price, which determined their purchases. The food-chains are aware of this and aim to meet customer demands, which leave the farmers with the eternal task of finding methods to produce food for the 'right' price. In real terms this means spiralling lower prices.

As producers we need to utilise new technologies and possibly do what food companies have done - get bigger, value-add, vertically integrate - to gain efficiencies and pick up downstream benefits. Or simply get out. While the benefits of economy of scale can be overestimated, there is certainly a need to ensure a farm business is large enough to absorb the everyday overheads, which can cripple a small business. While buying out the neighbour may not be an option, owing to levels of equity, there is opportunity for smaller operations to work together, thus picking up some of the benefits of larger entities.

Traceability

With regard to food safety, there have been numerous incidents in recent years that underline the importance customers put on food safety. The repeated cases of B.S.E. or 'mad cow' (Bovine Spongiform Encephalopathy) have led to complete trade bans on countries, for example the ban of U.S.A. beef exports to all 31 previous trading partners. While it seems that the U.S. has had a large enough domestic market to absorb their enormous supply, hardly affecting the average cattleman, the same could not be said for their close neighbour, Canada.

What we saw in Canada were feedlots bulging to the seams, with nowhere to go. I imagine by now that a lot of farms and companies will have 'gone to the wall'. The same would most likely happen in Australia if there was an outbreak of B.S.E., Foot and Mouth, or other exotic disease. I believe it will be only a matter of time before this happens. With our relative isolation we may be somewhat insulated from this risk, however with the 'chips at stake', and the current uncertainty in the world, even acts of bio-sabotage are not out of the question.

Australia has strict quarantine laws and enforcement, but prevention needs to be backed up with cures or damage-control mechanisms as a minimum. The advantages of traceability systems for all food products are becoming clearer. These systems may not prevent outbreaks or even control the damage, but their implementation is absolutely necessary for market access, with many countries now making identification systems a minimum requirement for trade.

Environmentally Friendly Products

We need to be farming in an environmentally sustainable manner, and owing to Australia's 'clean, green image' it is probably foolish for us not to capitalise on this market advantage. While the cash in hand benefits may not be obvious at this stage, it is possibly only a matter of time before foreign and domestic customers begin to demand our products are backed up by quality assurance.

Currently there have only been a handful of farmers who have implemented expensive quality assurance programs. To date these programs have offered limited perceived benefits, but in time I believe QA programs will become more streamlined, cost effective and common.

Environmental Management Systems are being introduced in countries with high levels of regulation like the European Union and the United States, and no doubt these systems will become compulsory here too. There are suggested market advantages in the early adoption of these systems.

DIVERSIFICATION - SMART FARMERS AREN'T FARMING

During the core tour, we had the pleasure of visiting some fairly progressive farmers, in all of the countries we visited. One of the things which struck me was not only how well they performed, with regard to production levels and efficient operations, but rather the fact that most of them had a significant spread of investments in other fields. None of these successful farmers was solely dependant on one particular enterprise. Their broader portfolios included significant interests in cash-flow businesses. These businesses varied greatly, from chicken farms, which had a steady flow of income, to real estate, to service or retail industries.

While a lot of these other businesses were still related to agriculture, they were not totally dependant on what yield they got from their limited acres, or the price received for specific commodities. Grain-drying and storage businesses in Ireland were a good example of this. As on-farm grain storage is not common there, a couple of farmers we visited, including Jim McCarthy, the Irish Nuffield Chairman, had seized the opportunity to build large concrete storage sheds, and also provided grain drying services. Effectively they rented their storage facilities out as warehouses, and commercially dried grain for other farmers.

This had the result of multiplying the turnover of his original farm. Another Irish farmer, Walter Furlong, has diversified into fertiliser supplies. The growth of his business was phenomenal. The basic principle applied by all these businesses was you don't need to be making a big margin on each unit provided your turnover is

high. In this age of global competition, tight markets and low commodity prices, I think the same principle needs applying to the general farm business.

This leads me home to consider, apart from off-farm cash-flow investments, how to lift the turnover of our livestock business. We don't need to be limited by our boundary fences, as there are agistment or lease options to increase our acreage. I also see an advantage in timing the purchases and sales of livestock, in the trading enterprise I propose, to even out the financial highs and lows. Unlike the situation now, when we have one or two sales per year, resulting in long periods of either high cash holdings or high overdraft levels.

RISK MANAGEMENT

On a finishing note, I see the need to try and manage risk, in an industry where markets are characteristically volatile. The recent BSE outbreak in the United States combined with drought breaking rain in tracts of Eastern Australia was "meant" to bolster the beef market. It didn't happen. In fact we have seen unseasonal drops in the northern Australian beef market, when traditionally it should have been strong. This highlights the fickle nature of commodity prices.

Futures

I would like to think the cattle futures market, recently made available by Meat and Livestock Australia, would be a tool to assist producer's lock in satisfactory prices in advance. We have dabbled with the futures, gaining a little here and losing a little there, but until there is more liquidity in the futures market, and we also gain a clearer understanding of the subtleties of this tool, its use will probably be limited.

Exotic Disease

Managing against the risk of exotic disease outbreaks presents a challenge. Compliance with all stock movement regulations and the adoption of traceability systems such as the NLIS scheme are a step in the right direction. But neither will make us totally immune or safeguard us against the market implications of an outbreak. We will have to give that one some thought.

Weather Predicability

I have pretty-well done a full circle now, and am back to where I started, at home in northern Australia, where we don't know if it's gonna' rain or not! But what we do know is the weather forecasting systems are becoming more accurate, even for the longer-term predictions. With a century of data meteorologists believe they can now predict seasonal probabilities with relative accuracy. While they are only probabilities, I feel there are enough other factors influencing our businesses, which we have no chance of picking, not to embrace the provision of rainfall probabilities as a worthy 'offsider'. You wouldn't base all your decisions on these probabilities, but their use is worth considering.