

Managing drought-feed and be damned

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Summary

Dry land farming and grazing are high risk businesses in Australia. Both systems are very recent arrivals in a continent that is the flattest, least fertile, most arid and climatically the most unpredictable in the world. Drought is one of the major risks faced by Australian farmers and graziers, and although public and government concern seems to vanish as soon as it rains, the possibility that another wide scale drought may be soon with us will mean that all the old unresolved concerns about how best to cope with drought will rise again. At the end of May in fact an estimated 30,000 eastern Australian farmers were in drought-declared districts which included 25% of the total area of Victoria, 40% of NSW, and 10% of Queensland.

This paper deals with grazing systems under drought conditions, and discusses the methods and ideas presented in a book 'A User's Guide to Drought Feeding'. The book resulted from a workshop held at the University of New England in July of 1995. The paper asks two main questions – does the 'User's Guide' still represent the most up-to-date and relevant ideas and methods for feeding animals during a drought; and is it of practical use to graziers. The paper concludes that the answer to the first question is a very positive yes, while the answer to the second question is qualified.

Two very different streams of thinking are discussed. The first stream which is supported by an unusual combination of economist, ecologists and pasture agronomists takes a **financial** and plants-eye view of drought. This group argues that a combination of significant financial benefits, improved pasture viability and a slowing down of long-term ecological degradation are powerful incentives for selling stock as early in a drought as possible. The second stream is supported by an equally non-conventional group of nutritionists and agronomists who argue that while feeding for survival makes little sense, feeding for production is a practical option both financially and environmentally, but only if it is part of an overall **long-term** production feeding strategy. This paper takes the

logic of production feeding a further step and makes a case for the development of regional production feeding options and the development of integrated production feeding systems.

One of the most sobering opinions voiced by graziers canvassed while writing this paper is that most grazing enterprises today are only viable if supported by secondary off-farm income. The paper discusses some of the more disturbing implications of this trend, and the increasing body of ecological **information** that suggests that our grazing systems are being maintained at the expense of a mounting and irreversible ecological debt which escalates during drought periods. At the moment it would seem that we have nothing better to offer graziers than the information and ideas contained in the 'User's Guide'. This paper argues that this is not good enough. The final section of the paper deals with one of the most important challenges that confronts animal scientists—the urgent need to find environmentally acceptable production feeding alternatives which will allow producers to get out of the present ecological impasse, and move towards a future of sustainable and perhaps very different food production scenarios.

Introduction

In July 1995 a workshop entitled 'A User's Guide to Drought Feeding' was held at the University of New England. With the drought worsening every month and with graziers having to dig deeply into back-up resources which had been depleted during three or more previously dry years, promises of support were generally immediate and unconditional. Within a fairly short time sponsorship was obtained from the Meat Research Corporation, the International Wool Secretariat, the Rural Industries Research and Development Corporation and the Land and Water Research and Development Corporation.

The main objective of the workshop was for those at the leading edge of Australian research and development to present methods and ideas which represented all that was best and most relevant about drought feeding and management, and then weld these into a publication which would provide graziers with clear and simple guidelines in an easy-to-use publication. In order to achieve this the papers were presented in the open forum of a workshop. Again spurred by the drought, it took little effort to fill a lecture theatre with producers and individuals from various sectors of the grazing industry, and to involve this group in serious debate with scientists on how best to keep grazing animals fed and productive during drought. In this paper we ask whether we got it right at the workshop and in the book.

In order to retain the same spirit of cooperative effort which led to the publication of the 'User's Guide' in January of 1997 we went back to each contributing scientific group or individual and asked them if there was anything new which would change or enhance the technologies or ideas presented in the Guide. The answer was a universal no either directly or by default, so that unless someone is on the verge of some new break-through and is reluctant to discuss it yet, the 'User's Guide' apparently contains the best advice the Australian scientific world can offer to producers. As a producer, this worried me a bit at first because with a couple of exceptions, most of the scientific messages in the 'User's Guide' simply put a slightly new spin on delivering a ball that had been bowled many times before during the last ten or fifteen years.

Putting a new spin on an old message

As anyone who has even a passing interest in cricket will know however, a slight spin can mean the difference between winning or losing a match, or for a grazier, staying viable or going out of business. The spin that this workshop gave to the issue of drought feeding and management was that there are only two sensible strategies open to most graziers when drought occurs – to sell without hesitation, or to bring into action the drought feeding component of an overall production feeding programme. Selling livestock when local indicators suggest that a drought is on its way has been the long term preferred option for some of the more successful survivors in the hard world of central Australian grazing. Their theory is that you can always buy back in if you are wrong, but if you are right then you save a heap of money. The analysis by the Centre for Agricultural and Resource Economics (Thompson pp. 11-17) agrees with this hard nosed approach suggesting further that it does not matter whether a grazing system is arid or temperate, for most graziers it will always be more profitable (less costly) to sell livestock rather than feed them in times of drought. The

case for selling is even more compelling if graziers have to fall back on emergency feeding programmes and buy in feed.

Indicators and probabilities

Great said the graziers on our panel, but what if we unload our stock only to find that conditions that looked liked shaping into a drought were suddenly altered by unpredicted bumper rains. We would all look like fools. With all the talk about the influence of 'el-nino' and the southern oscillation index (SOI), can the weather bureau make life on the land just a bit less of gamble than it is. As you can read in the paper from the Bureau of Meteorology (Spark pp. 47-53), there is still no certainty in the science of weather prediction, but our understanding of weather indicators and weather systems is improving fast, as are probability indexes or weather form guides. In the bush, the state of the weather will generally precede any other topic when two or more graziers meet beside a track or in the pub. A couple of years ago Lennox Walker and other local indicators would have been quoted but these days you are just as likely to here someone say that it is a bit worrying to hear on the radio that the SOI has suddenly dropped to minus 18 in the last two weeks. My point is that it is not that Lennox Walker is necessarily wrong or that local indicators should be ignored, but that graziers will quickly take on board quite complex forecasting methods that seem to make sense and which will help in decision making and risk reduction, but to do so they need to be kept informed.

A pastures-eye view of drought

In his paper on pastures in the 'Users' Guide' (pp. 75-84), Scott also subscribes to the destocking approach. He proposes that many graziers seem to have forgotten that pastures are the best and cheapest feeding option for grazing animals; that there is no such thing as an optimum stocking rate and that graziers would never flog an animal the way they sometimes flog their pastures. The paper also suggests that sustaining stocking rates with feed supplements is a sure way to depress long term pasture viability, and that one of the most important management decisions that any grazier can make is to reduce stock numbers early enough in drought or dry conditions to ensure the long term viability and productivity of pastures. Scott describes how perennial pastures in the tablelands of northern NSW have been degraded by hard grazing even during short dry periods and Foran (pers comm. 1997) believes that there is strong and undeniable evidence that Brahman cattle and supplementary feeding with molasses to sustain high stocking rates, have been directly responsible for the irretrievable ecological destruction of large areas of land around Charters Towers. And yet graziers in northern NSW rarely reduce

stocking rates just because it gets a bit dry and instead resort to supplementation. The introduction of *bos indicus* genes and molasses supplementation have been recommended by the State Agricultural Department, various research groups and the Users' Guide as key production and survival strategies for Queensland grazing systems. It may be time to sit up and take notice when economists, pasture scientists and ecologists all seem to agree on a common theme, but first let us look at other aspects presented in the Users' Guide.

Tree and shrub fodder banks will only provide short term credit

In recent years there have been many scientific papers and articles in the popular press citing the potential of trees and shrubs to act as dry season or drought reserve protein fodder banks. The deep root system of trees and shrubs makes them more resistant to short term moisture shortage. The chapter titled 'Beyond the Herb Layer' (pp. 99-109) in the 'User's Guide' confirms what has become common knowledge for most graziers—while there have been some notable niche success stories such as Tagasaste in the sand soils of Western Australia (McNeill & Oldham), Mulga in Queensland (Johnson & Beale), and Leucaena in the wetter tropical areas (Norton & Gutteridge), in a long term drought trees and shrubs will eventually follow the earlier lead of pasture grasses desiccating to the point where they are of little feed value or adopting defensive measures such as high tannin levels which reduce their appeal and palatability. Thus although trees and shrubs can be seen as a useful dry season supplement to pastures, and may extend the grazing tolerance of an area, unless we can find a 'magic tree' they will remain important but minor players in the drought feed stakes.

Feeding for production

For those graziers who do not wish to always have to destock whenever it gets a bit dry and for whom tree or shrub fodder banks are not a viable alternative, the 'User's Guide' offers a two step alternative. The first step is to accept that dry conditions are 'normal' rather than exceptional and that drought is an integral part of all Australian grazing systems. The second step is to plan to manage drought feeding as an extension of a long term production feeding strategy. Unless a grazer is very lucky, making plans for drought feeding once a drought has started and feeding for survival is almost the same as pouring money down the drain; and yet in the northern tablelands of NSW which was severely affected by the recent drought, most of our grazer neighbours opted to feed cattle or sheep rather than sell them, and few were working on the basis of forward planning or production feeding. Does this explain why in 1996, the year the drought broke, cattle numbers were

the highest for 16 years (Meat Industry Annual Report, 1995/96) but at the same time the overall debt burden of graziers had increased markedly. Animals had survived but had our neighbours fed for production rather than survival and so been able to sell finished stock during the drought when prices were reasonable instead of after the drought when cattle prices slumped, the debt story may well have been a lot different. On the other hand in 1996, the national sheep flock was at its lowest absolute level since 1954. The Meat Industry Report cites continuing poor wool price rather than drought as the major reason for low sheep numbers. It will be interesting to see what happens to the national beef herd if the low market prices of 1996/97 continue. The possibility that markets have more affect on livestock numbers than drought however, is not a good sign for the ecology of our grazing lands.

For those brave enough to take the decision to feed for production even during drought the first rule of thumb proposed by the Users' Guide is to slim down a herd or flock to those animals which will make money under a production feeding regime which becomes the mainstream feeding option. The second rule of thumb is to forget the old standby feeds of the past of hay or silage unless these are home made. Even if cheap local hay is readily available protein supplementation will be necessary for effective production feeding although silage can be a useful production feeding alternative. Neither hay nor silage should however be seen as drought back-up feed sources only (Kaiser *et al.* pp 85-98) although abundant supplies of low quality roughage may allow graziers to delay the implementation of alternative higher cost feeding and management strategies (Dixon & Doyle pp. 61-74). The third general rule is that by-pass protein and associated technologies can be very effective in maintaining productivity including the fertility of breeding stock provided there is adequate poor quality dry feed in the paddock, or very cheap roughage is available (Hennessy *et al.* pp. 21-34). As Scott points out however, unprocessed roughage carries with it the risk of spreading weeds such as parthenium or of creating very serious meat marketing problems from pesticide residues such as the helix contamination of cotton trash in north western NSW which ruined several graziers in 1995 and cost others dearly.

The fourth rule is that if the first two groups of technologies are not suitable for a particular grazing option then it is time to select an alternative production feeding strategy from a menu of production feeding options, most of which are described in the 'User's Guide'. These range from tried and tested energy/protein feeding combinations based on molasses (Lindsay & Laing pp. 55-59) to the newer option of safely feeding cereal grains to ruminants in association with virginiamycin (Rowe *et al.* pp. 35-45). In common with the proven ability of by-pass proteins to improve the feed value of low quality roughages, the capacity of virginiamycin to reduce the adverse affects of grain

feeding represent two of the most important practical and useful achievements of the last ten years in the field of animal nutrition.

The main aspect that differentiates the 'User's Guide' from most of its predecessors is the emphasis given to feeding for production rather than for survival. All of the feeding options that fit under the third and fourth general rules above can and should be used to enhance profitability in good rainfall years as well as supporting productivity in years of drought. There is probably no universal best choice feeding technique and the selection of a particular option will be based entirely on opportunistic factors. Differing techniques such as the use of by-pass protein or virginiamycin treated cereals should be seen as complementary rather than competitive. Both methods have substantially widened the range of production feeding options available to graziers.

The only sensible alternative to production feeding is to plan to take a pastures-eye view of the land at all times, and to continually adjust livestock numbers and type to suit prevailing climate and pasture conditions. This will not be easy, nor will it necessarily provide adequate financial returns unless properties are large, diverse, and financially secure. For graziers who wish to embark on a supplementary production feeding programme, selecting an option will be mainly a matter of convenience, location, the availability of supply, and the application of a cost/benefit analysis.

Regional production feeding menus

One of the more important practical applications of the concept of production feeding may be to develop regional or local area production feeding 'menus'. Such menus would be based on the opportunity costs and availability of various feedstuffs such as cottonseed meal and other by-products, cereal grains or sugar industry by-products. The development of regional production feeding menus could form the basis of new and challenging opportunities for the development of integrated supplementary feeding systems, opportunities which do not yet seem to have filtered into the planning and policy mainstream, but which nevertheless may be one of the most important innovations and extension opportunities waiting to happen to the grazing industry.

Will graziers use the Guide

With the question of the integrity and immediate relevance of the scientific content of the 'User's Guide' put to bed, the next question to be answered was whether the publication was of practical use to producers. We asked this question of the panel who led the questioning at the workshop. The answer from those who responded was a qualified maybe with the 'Overview' section cited as the most useful and most

readable part. Why only a maybe? Well, the way in which the scientific information was presented was thought to be still a bit daunting to a grazier who was looking for information in a hurry particularly as there was no index where subject matter was cross-referenced.

The more thoughtful of our producer respondents stated however that if you are in a hurry for information in a drought then you have already lost the race. Some believed that drought may not even be the greatest risk faced by graziers, and that drought management strategies should be seen simply as one component of overall property management plans for the management of a wide range of other risks in a high risk business. If the 'User's Guide' is to attract a more universal readership, there would however seem to be a case for the production of a version written in the same reader-friendly style as the overview. This second edition of the User's Guide' could be seen as a supplementary aid to the development of regional production feeding menus.

Can the farm of the future stand alone

One of the more worrying responses to the questions we put to the panel was the opinion that most grazing enterprises today are only viable if supported by a secondary off-farm income from investments or off-farm work (Williams *et al.* pers. comm.), and that an alternative income source may mean the difference between survival and going under during a drought. Why we should sit up and take notice of this statement is that it is not just another statistic produced by ABARE economists, but the opinion of producers who have been in the business for generations and who today have to face the reality of trying to balance the books at the end of each financial year. What other business in Australia will only survive if the owners have to support their operations with alternative investments or where half the shareholders have to go to work and inject their cash income back into the business to keep it afloat; and what other business does government believe can be kept viable mainly by dole payments to the owners? I cannot think of any, but this is the current status of the grazing industry particularly during drought.

The Meat Industry Councils' 1995/96 Annual Report cites some 17,400 specialist beef producers as owning 6 1% of the total beef herd. Of these, the top 10% of families own 30% and 280 corporate holdings own a further 16%. The other 16,000 or so producers own the rest. In Queensland this is described as the 20/60/20 factor. What this means is that lending institutions believe that most Queensland grazing operations can be placed in one of three categories. The top 20% are mainly old established family concerns or corporate holdings who fit into the top category of the MIC report and who have deep pockets to draw on when times are

hard; a middle 60% who are scraping along at little or no profit and whose decision to stay or quit during a drought or stress period is more often than not dependent on the size and reliability of an alternative income source; and a bottom 20% who sooner than later will be forced to sell or face foreclosure.

I know all about the middle 60% **from first** hand experience, and the fact that more and more **of this** grazier category are opting to sell rather than continue to face the depressing grind of trying to stay in business. However, had we and many like us been a member of an integrated production feeding group whose drought feeding strategies were part of an opportunistic long term production feeding strategy based on a regional feeding menu, then maybe we and many more family cattle grazing businesses like us would still be in business and could expect to remain so beyond the end of the decade and into the next generation of producers. But then again, maybe nothing can stop the inevitability of shrinking grazier numbers and maybe the Australian Bulletin (May 6th 1997) is correct and only the top 20% **of Australias'** farmers will still be in business in ten years time. Comparative information was not available for the 72,000 sheep producers in Australia.

How soon we forget, how much we regret

Maybe it is because I have been so closely involved with the effects of drought in countries other than Australia that I do not seem to have the very short weather memory that government and so many graziers seem to have. I have lost count of the number of times I have heard otherwise sensible country people remark that it is good that the weather was getting back to a normal pattern and yet my own rainfall records (northern NSW) suggest that the rainfall pattern in 1996/97 has been exceptional rather than normal. Nevertheless, as I write this paper, issues that excited the imagination of so many when the recent drought was at its peak are now matters of little interest. Not only has the policy debate on matters such as income equalisation deposits or farm management bonds stopped dead in its tracks when the drought broke in 1996 (Symmonds pers. **comm.**) to be replaced by issues such as native title and land tenure, but the vitality of interest throughout the industry that seems only able to be generated by drought crisis conditions has become bogged down in the mud-holes of bureaucratic indifference, or put aside by graziers scrambling to stay afloat in a post-drought market of low cattle and wool prices. And yet, as I write this paper, somewhere in rural Australia some farm **family** will almost certainly be sitting on a verandah cursing the poor prices they have just received for stock they had nursed through the drought on survival rations and wishing they had fed for production and sold the lot during the drought when prices were reasonable, or will be gazing out in despair over a parched landscape

and trying to plan just how they will keep on going until it rains. It is also just as possible that to add to the woes of the rural sector, the next major drought for this region could be starting even now and we are just as unprepared as we have always been.

At war with the land

Few other farming societies see themselves as being at war with their land and the elements, but we do. We fight flood and fire and drought, we fight pests and disease, we fight weeds; in a word we are at war with our environment and if we are to believe our ecologists, it is a war that we are beginning to lose. Our language has always emphasised the hostility of the environment and our response has been to try and beat the land into submission, to change it with radical surgery, and to enhance its metabolic rate and fertility with massive injections of energy and other resources. Every day for as long as there has been settlement, **farmers** and graziers have unconsciously taken a deep breath as they walked out through the gate in the white fence fortress wall that so often surrounds the small green square of carefully manicured land around the homestead, bracing themselves to do battle with the land. While most thinking graziers accept that the 'battle with nature' mentality of the past is one of the reasons their systems are under stress, they are not yet ready to accept that in many cases the stresses may be the **first** signs of a terminal illness.

It was not a war that was fought by the original inhabitants of this continent and while we should not get carried away by the ecological virtue of fire-stick management systems, the aboriginal societies that practised them certainly had a long shelf-life. Even more importantly, **Foran (pers. comm.)** believes that aboriginal survival strategies took perhaps only 5% off the shelves of the continents ecological supermarket during drought while our grazing and farming systems threaten to take everything, and have already irreversibly ruined most of our **fragile** but vital arid area riparian areas. Even more alarming is a recent rangelands report which recommends that 17% of land currently grazed should be taken out of use immediately while further areas will require extremely sensitive management to slow down the current unacceptable rate of soil and vegetation degradation.

There is also little evidence that we can take comfort **from** levels of technology vastly superior to those available to any previous era for the track record of global technological advances is that they have drastically worsened our impact on the environment (Diamond 1997). Seen from the perspective of a few decades past, the environmentally destructive power of our current society is unimaginably greater than it has ever been. This power is in full and increasing flow and is not likely to be checked until governments are prepared to spend more money on combating land degradation than they are on supporting car races.

Sometimes in fact it takes an outsider like **Jared Diamond** in his lecture to the 1996 Anzus Congress to jolt us into remembering that our grazing systems are very recent arrivals in a continent that is the flattest, least fertile and climatically the most unpredictable in the world. It is more than sobering to be reminded that Australia is also the only continent in the world where the climatic differences between years are greater and more unpredictable as a result of enso-oscillations than the regular climatic differences between seasons in the same year. Even more worrying are the example after example cited by Diamond of societies who have tried throughout history to exploit the natural resources of environments less arid and less fragile than Australia, and who ultimately failed when they pushed that exploitation beyond the boundaries that their systems could sustain.

The last gasp in a race to nowhere

You would think that in an era where information is so freely available, only fools would ignore the larger lessons of history, and yet if Diamond is right, that is exactly what we are doing in Australia. When I looked at all the various methods and ideas that are presented in the 'User's Guide' I began to wonder just what effect these might have on the sustainability of grazing systems in Australia. What if the methods and technologies that we were encouraging graziers to adopt were not sustainable in the long term. What if they were in fact the last scientific gasps of runners in a race to nowhere. If this is so then the 'User's Guide' may well be the last of its type, and no matter how 'user-friendly' the book is, it is in fact no more than a temporary bandage which graziers can use to stop bleeding to financial death during drought while we as scientists work out how to halt the slowly unfolding ecological death of their system.

Australian society now expects the continent to support a hundred times the number of people sustained by Aboriginal systems. Australia now produces eight to ten times the amount of meat, cereals and sugar than is needed to support the population. We have laid the foundation for our current economy and society by exporting the rest but in continuing to do so there is a mounting body of evidence that we are moving increasingly into irretrievable ecological debt (Diamond 1996). In an analysis of the "ecological footprint" of Canberra, **Foran & Poldi** (1996) showed that about 27% of the city's footprint area was required to supply food, and of that area, more than 80% was taken up by the production of beef and sheep meat. It is hard to avoid the conclusion that the '**hoofprint**' of ruminant meat production is a disproportionately large segment of a footprint thought to be already too large and which is ten to twelve time bigger than the ecological footprint of third world urban centres.

All this may make riveting reading but what in the devil you may ask, has it to do with the **every-day**

business of trying to keep ruminants alive and productive during drought. Well, if our grazing systems are maintained at the expense of a mounting and irreversible ecological debt even in years of reasonable rainfall, that debt is likely to escalate during periods of environmental stress. In fact, if you read carefully through the 'User's Guide', you may well conclude that with the possible exception of the introduction of the tagasaste shrub in the deep sand areas of Western Australia, every other drought feeding strategy described in the Guide will increase our ecological debt somewhere along the line. In addition, if ruminant meat production already takes up too much space in the "footprint" of our consumer areas then what are we doing in trying to sustain production levels during stress periods and should one of our major research objectives be aimed at reducing the '**hoofprint**' of animal protein production?

Feed and be damned-the challenge for the future

Edward de Bono is not what you might call 'an easy read', but his ideas are challenging and a lot of the worlds best thinkers tend to sit up and take notice of what he writes. In his 1990 book "I am Right, You are Wrong" he set out to challenge what he called the crude and primitive logic of western thinking. When dealing with science de Bono described scientists as tending to fall easily into a rut of looking at things only in one way, resisting and dismissing efforts to look outside that rut and change their views until at last, much later, the evidence is overwhelming. Scientists he wrote, have never learnt to dance but prefer to shuffle around the floor taking small and sometimes imperceptible steps forward; and yet perceptual organisation requires steps backwards as well as forwards-as in dancing. In order to advance, we should look creatively at the past, not only the future and be prepared to take steps that are not necessarily in line which each other.

It is never easy to take a serious present view of the evidence of the gradually unfolding ecological disaster that threatens the grazing areas of Australia, nor is it easy to ask hard questions about the viability of the future of current ways of producing animal protein. In the meantime there will be many more droughts, and when these occur it would seem that right now we have nothing better to offer graziers than the information and ideas contained in the '**User's Guide**'. If we choose to ignore the ecological downside of sugar, cotton and cereal production for example then it makes sense to promote production feeding as the way to go. If we do not, then putting pastures **first** and adjusting livestock numbers to suit plant production capabilities is the most sensible and ecologically sensitive option.

However, in their current **forms**, neither of these options are likely to allow graziers to stay in business in the long term. From the graziers point of view, there is a

major future challenge for animal scientists. The challenge is **this**—to find ecologically acceptable production feeding methods which will allow producers to begin to make the transition **from** the unsustainable production systems of the present to those of the future.

At this point there is the temptation to join the ranks of one of the ‘**end-is-nigh**’ doomsday group and make dire predictions about what will happen if we continue to act as if we can keep on following the same well worn animal feeding and management pathways forever. I will not do this, but I will say once again that there is mounting ecological evidence that we cannot continue to treat the surface of **Australia** as a resource to be endlessly mined to produce animal protein and fibre; that our current systems of agricultural production almost certainly exceed the ecological limits of our natural resources; and that the way in which our production systems crash during droughts are just one way that the environment serves notice of the vulnerability of our tenure and the unsustainability of our production systems.

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