The Australian Rangeland Society

Range management Newsletter

No. 85/2 May, 1985

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Immediate Past President: Bill Low
Secretary: Colin Lendon
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C.S.I.R.O.
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EDITORIAL

Don Bumside

Nobody can say that we shy away from controversial issues here at Range Management Newsletter! In this issue we have a carefully thought out and worded statement from Brian Roberts, who calls for the establishment of a “Land Ethic” in Australia. Brian argues that an appropriate land ethic would add a much needed dimension to Australia’s national life, and would bring home to all Australians some of the realities about the land that we live in. I would add that I believe that many of our practising rangeland managers have a far better grasp of these realities than do the decision makers in the capital cities!

By coincidence we also have an article by Henry Schapper which is critical of the “land ethic” approach and also critical of the lack of pastoralist involvement in land management programmes. Henry, who is well known to us in the west for his forthright and penetrating views, likens land ethics to motherhood, and says that conservation issues cannot be considered in isolation from the harsh winds of financial fortunes.

Well what do you think? Write and let us know! As well we have a number of papers emanating from the Bourke branch’s first extravaganza on the management of shrub infested rangelands; and we also have a paper on the reclamation of ridge soils at Cobar. Read on, and I hope you enjoy it!

COUNCIL BUSINESS

Australian Rangeland Society Travelling Fellowship

In view of the continuing favourable financial position being experienced by the Society, Council is pleased to announce the establishment of a Travelling Fellowship Fund. This is to be open to applications from members wishing or intending to travel in pursuit of means to better range management in Australia.

Guidelines

1. The Award shall be known as the Australian Rangeland Society Travelling Fellowship.
2. The Fellowship(s) shall be awarded, or not awarded, by council, on the merits of written application and proposed itinerary (not exceeding 1000 words) clearly expressing the objective to be received by Council not later than November 30, each year. Applications should include details of costs and of any funds supplied by other bodies.
3. A Fellowship is intended as a means by which land managers and students who wish to investigate a topic connected with range management are assisted towards meeting fares or transport costs (but not subsistence) incurred through travelling for a purpose appropriate to the award.
4. Appropriate purposes include travel costs for visits to interstate or overseas destinations at which relevant development, experimentation or education in range management techniques are in progress; or for travel costs incurred more locally to implement a programme of rangeland investigation not being undertaken by government agencies, universities or other tertiary institutions at the time.
5. The maximum amount awarded under a Fellowship shall be $1,500.
6. The amount awarded in any one year shall not exceed $2,000.
7. All members of the Australian Rangeland Society are eligible to apply. No formal qualifications are required.
8. Any Fellowship awarded must be properly accounted for by the recipient.
9. On completion of a Fellowship, the recipient shall report on his or her findings to Council within six months.

Colin Lendon, Hon. Secretary.

New Members

A. A. Abdullah, Khartoum, Sudan
D. M. Beurle, Carnarvon, W.A.
M. N. Brown, "Glengeera" Bourke, N.S.W.
B. Daniel, "Catninga" Stirling North, S.A.
E. Faithfull, Adelaide, S.A.
P. W. Johnston, Tarragindi, Qld.
J. Kingston, Maryborough, Qld.
F. H. Kleineschmidt, Lawes, Qld.
L. M. Long, Ashford
G. O’Brien, Yeppoon, Qld.
R. J. Petheram, Armidale, N.S.W.
G. D. Rankine, St. Marys, S.A.
G. Sharp, Stanmore, N.S.W.
B. Teede, "Far End Plantation", Carnarvon, W.A.

The Subscriptions Secretary Alan Payne does not have precise addresses for L. M. Long or M. Wallis. Could those members please let Alan know their whereabouts!
Change of Editorial Committee of the Journal

(CONTRIBUTORS PLEASE NOTE)

Dr. Tony Pressland has recently resigned after several years as Chairman of the Editorial Committee of The Australian Rangeland Journal. Mr. Peter Schmidt has also resigned as a member of the Editorial Committee. The appreciation of the Society members is extended to both Tony and Peter for the effort they have devoted to ensuring the standard of the Society’s major publication.

The new committee members are Dr. Ron Hacker (Chairman) and Mr. Peter Curry, both of the Rangeland Management Branch, W.A. Dept. of Agriculture. Dr. John Lindsay (Dept. of Primary Industries, Q’ld), a member of the previous Editorial Committee, is the third member of the new committee. Manuscripts submitted to the previous Chairman have been handled by the new committee since January, 1984.

As the current Chairman will be overseas until October, 1985 manuscripts submitted prior to that date should be forwarded to the Acting Chairman —

Mr. P. Curry
Rangeland Management Branch
Department of Agriculture
Jarrah Road
SOUTH PERTH W.A. 6151

Thereafter manuscripts should be submitted to the Chairman (Dr. R. B. Hacker) at the same address.

Financial Report, 1984

AUDITORS’ REPORT
TO THE MEMBERS OF THE AUSTRALIAN RANGELAND SOCIETY

We have audited the accompanying financial statements of the society set out on pages 2 to 4 in accordance with Australian Auditing Standards.

In our opinion, the financial statements present fairly the financial position of The Australian Rangeland Society at 31st December, 1984 and the results of its operations for the year then ended in accordance with Australian Accounting Standards.

Deloitte Haskins & Sells
R. H. BRAY, Partner
Chartered Accountants
Perth, W.A.
16th May, 1985
# THE AUSTRALIAN RANGELAND SOCIETY

## BALANCE SHEET

**AS AT 31st DECEMBER, 1984**

### MEMBERS FUNDS

<table>
<thead>
<tr>
<th>Description</th>
<th>1984</th>
<th>1983</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balance 1st January, 1984</td>
<td>25,580</td>
<td>31,585</td>
</tr>
<tr>
<td>Profit/(loss) for the year</td>
<td>5,642</td>
<td>(6,005)</td>
</tr>
<tr>
<td><strong>Balance 31st December, 1984</strong></td>
<td><strong>$31,222</strong></td>
<td><strong>$25,580</strong></td>
</tr>
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</table>

### ASSETS

<table>
<thead>
<tr>
<th>Description</th>
<th>1984</th>
<th>1983</th>
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<tbody>
<tr>
<td>Cash at bank - Subscriptions account</td>
<td>2,011</td>
<td>266</td>
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<tr>
<td>Cash at bank - Publications account</td>
<td>1,199</td>
<td>1,524</td>
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<tr>
<td>Cash at bank - Savings Investment account</td>
<td>25,736</td>
<td>21,500</td>
</tr>
<tr>
<td>Cash at bank - Newsletter account</td>
<td>324</td>
<td>-</td>
</tr>
<tr>
<td>Cash on hand</td>
<td>-</td>
<td>28</td>
</tr>
<tr>
<td>Stock of publications - Journals (Note 2)</td>
<td>2,320</td>
<td>2,430</td>
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<tr>
<td>Stock of publications - Books</td>
<td>195</td>
<td>350</td>
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<tr>
<td>Interest receivable</td>
<td>1,565</td>
<td>604</td>
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<td><strong>Total Assets</strong></td>
<td>33,350</td>
<td>26,702</td>
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### LIABILITIES

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<th>Description</th>
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<tbody>
<tr>
<td>Subscriptions</td>
<td>2,128</td>
<td>1,122</td>
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### NET ASSETS

<table>
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<tr>
<th>Description</th>
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<th>1983</th>
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<tbody>
<tr>
<td><strong>Net Assets</strong></td>
<td><strong>$31,222</strong></td>
<td><strong>$25,580</strong></td>
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</tbody>
</table>

This balance sheet is to read in conjunction with the attached notes.
THE AUSTRALIAN RANGELAND SOCIETY

DETAILED PROFIT AND LOSS STATEMENT
FOR THE YEAR ENDED 31st DECEMBER, 1984

<table>
<thead>
<tr>
<th></th>
<th>1984</th>
<th>1983</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>INCOME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subscriptions</td>
<td>9,981</td>
<td>10,658</td>
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<tr>
<td>Sale of publications</td>
<td>1,682</td>
<td>1,545</td>
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<tr>
<td>Reprint sales</td>
<td>385</td>
<td>533</td>
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<tr>
<td>Interest</td>
<td>2,323</td>
<td>2,694</td>
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<td>Other income (Note 1)</td>
<td>4,000</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>18,371</td>
<td>15,430</td>
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<tr>
<td>Less: EXPENSES</td>
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<td></td>
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<tr>
<td>Audit fee</td>
<td>225</td>
<td>203</td>
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<td>Bank charges</td>
<td>13</td>
<td>12</td>
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<tr>
<td>Branch subsidies</td>
<td>436</td>
<td>208</td>
</tr>
<tr>
<td>Computer charges</td>
<td></td>
<td>906</td>
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<td>Editors expenses</td>
<td>200</td>
<td>300</td>
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<tr>
<td>Freight</td>
<td>9</td>
<td>32</td>
</tr>
<tr>
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<td>1,386</td>
<td>1,320</td>
</tr>
<tr>
<td>Honoraria - Secretary</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>Honoraria - Treasurer</td>
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<td>50</td>
</tr>
<tr>
<td>Honoraria - Membership Secretary</td>
<td>100</td>
<td>50</td>
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<tr>
<td>Honoraria - Chairman</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Honoraria - Rangeland Newsletter Editor</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Postage</td>
<td>1,918</td>
<td>928</td>
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<tr>
<td>Production of journal</td>
<td>3,843</td>
<td>2,304</td>
</tr>
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<td>Production of newsletter</td>
<td>2,803</td>
<td>320</td>
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<tr>
<td>Publications</td>
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<td>8</td>
</tr>
<tr>
<td>Purchase of books for resale</td>
<td>1,025</td>
<td></td>
</tr>
<tr>
<td>Stamp duty</td>
<td>41</td>
<td>6</td>
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<tr>
<td>Stationery</td>
<td>179</td>
<td>317</td>
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<tr>
<td>Sundry expenses</td>
<td>151</td>
<td>4</td>
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<tr>
<td>Travel</td>
<td></td>
<td>137</td>
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<tr>
<td>Write down of publications (Note 2)</td>
<td></td>
<td>14,280</td>
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<tr>
<td></td>
<td>12,729</td>
<td>21,435</td>
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<tr>
<td>Profit (Loss) for the Year</td>
<td>$ 5,642</td>
<td>$(6,005)</td>
</tr>
</tbody>
</table>

This profit and loss statement is to be read in conjunction with the attached notes.
1. OTHER INCOME

This abnormal item of income arises from the repayment of a loan which was incorrectly expensed when advanced by the Society in 1981 and 1982.

2. WRITE DOWN OF PUBLICATIONS

$  -  $14,280

This abnormal charge arises from the write down of publications stock to the lower of cost and net realisable value. Previously, publications were brought to account at selling prices.
FROM AROUND THE TRAPS

Broken Hill Branch News

Geoff Woods
Department of Agriculture
Broken Hill

The Annual General Meeting of the Broken Hill Branch will be held on Friday, 19th July, 1985 at the Broken Hill Club, starting at 1.30 p.m. central standard time.

The guest speaker at the meeting will be Mr. Doug Pearson, Western Lands Commissioner.

SEMINAR

MANAGEMENT OF SHRUB INFESTED RANGELANDS — BOURKE, APRIL 26, 1985

The Bourke Branch of the Australian Rangeland Society sponsored this successful seminar in Bourke. Phil Fogarty did the organising and also very kindly provided a copy of the seminar booklet.

The seminar was jointly present by:
- Division of Wildlife and Rangelands Research,
- C.S.I.R.O. Deniliquin.
- Charleville Pastoral Laboratory (D.P.I., Queensland)
- Department of Agriculture, N.S.W.
- Soil Conservation Service, N.S.W.
- Western Lands Commission.

It is certainly good to see these bureaucracies able to put their collective ideas into the ring at such a seminar.

Several of the papers presented at the seminar have been re-printed here for the benefit of the wider audience. It is a pleasure to see that sound, sensible management strategies are being recommended in these papers. Things have obviously come a long way since the scientific and pastoral communities first looked blankly at the “nasty” shrubs and wondered what to do! We should have a few more of the papers in the next issue of Rangeland Management Newsletter.

The Use of Fire in Property Management

Graham Harrington
Division of Wildlife and Rangelands Research
C.S.I.R.O., Deniliquin

Fire may be used as an ecological management tool to control shrubs. Impact on the pasture is not great and fire is not recommended for managing grasses.

There are two situations where shrubs may need to be reduced by fire - populations of mature shrubs and a proliferation of seedlings.

Ideally shrubs should be controlled at the seedling stage because:
- all shrub species are susceptible at this stage;
- low intensity fires are effective;
- economic losses, due to shrubs adversely affecting stocking management and pasture production, are avoided;
- grass growth is adequate for burning when shrub seedlings are present because they are both stimulated by above-average rainfall;
- burning opportunities are infrequent and become less frequent as the seedlings develop into mature shrubs and suppress grass growth.

Where mature shrubs have been allowed to establish, burning management should be related to the species. Stands dominated by budbrush or turpentine will be little reduced by fire and would not be priority target areas. Useful reductions in punty (broombush), hopbush and mulga can be anticipated. “Hot” fires are required in such circumstances in order to penetrate densely bushed areas and actually singe the susceptible bushes.

Burning stands of mature shrubs reduces their size and the amount of shrub leaf per hectare. This releases more moisture for pasture growth for a few years even where shrubs are not killed.

Burnt shrubs produce less seed for many years (none at all for 3-7 years after the fire). A burn in late spring can actually destroy the seed on the bushes.

Thus strategic burning of the “red country in western N.S.W. will reduce size of shrubs, density of shrubs and available seed so that shrub populations will be held in check rather than getting ever more dominant.

Such a strategy will be dictated by the rainfall seasons and the economic situation. Burning opportunities are scarce (once in 5-20 years according to site) and they are diminished by the presence of mature shrubs. Most of the Cobar/Byrock area could not support a burn between 1921 and 1984!

Grazing management plays an important role in this story. Shrubs establish more frequently where summer grasses have been grazed out. This is because such grasses rapidly use summer rainfall and the shrub seedlings die. Remove or reduce the vigour of such grass and the seedlings survive.

The take home message is this: If you have perennial grass on your property don’t “flog” it. After wet spring or autumn watch out for shrub seedlings. Try to avoid grazing such areas and if the seedlings survive the following summer burn in the autumn. If you have a problem with mature shrubs minimise your grazing pressure in a wet year and burn as early as possible (to destroy seeds) but as hot as possible to maximise the influence of the fire.

Miss burning opportunities at your long-term economic peril. The “climax” vegetation on red country is a woodland in the absence of fire. No precise frequency of burn can be prescribed - opportunities to burn and the necessity to do so are related to rainfall.
Effect of Fire on Shrubs and Grasses

Ken Hodgkinson
Division of Wildlife and Rangelands Research, C.S.I.R.O., Deniliquin

Key Points
- Wildfires are a normal feature of these rangelands and before settlement they were frequent (every 5 to 20 years) to check shrubs and trees and maintain grass dominance. Grazing and wildfire control has reduced fire frequency - the price paid is shrub increase and grass decrease.
- All plant species are adapted to survive periodic fires (each species has its own strategy) but their relative abundance in a particular area is greatly influenced by fire frequency. Shrubs decrease and grass increases as fires become more frequent.
- Mortality of established shrubs varies greatly depending on the species. Turpentine and bunda readily coppice after fire (15-20 percent die). In contrast mulga and narrow leaf hopbush have low resistance to fire (75-95 percent die).
- The season and intensity of fire has little effect on individual shrub mortality compared with the large effect of shrub species. However, on an area basis more shrubs are killed as the "burnt out percentage" increases - a function of fire intensity.
- Recently established seedlings of all shrub species are nearly always killed by fire.
- Seed of some shrub species easily killed by fire, e.g. punty bush and narrow-leaf hopbush may be promoted to germinate, by the fire cracking their hard seed coats. However, the chance of more shrubs establishing than were present before fire is very low because - there must be conditions suitable for germination and then establishment of the shrub seedlings; - germination only occurs in limited local patches, e.g. around a burnt out log and under old bushes.
- Grasses, both short and long-lived, are generally resistant to fire and on average about 5 percent are killed.
- Fire does not damage the pasture - in fact it improves productivity by reducing the competition from shrubs. Also the gaps created by death of shrubs and removal of dead annual plants and some short-lived grasses enables more pasture species to establish. The species that establish will be governed by the time and duration of rainfall.
- It would seem desirable to rest burnt areas from grazing until the perennial grasses seed again although no research has been done on this.

Conclusions
There is now sufficient information about the effects of fire on plants to confidently use fire as a shrub management tool for broad acre control. However the degree of shrub control achieved will depend mainly on the mixture of shrub species and their age. Areas recently invaded by shrub seedlings can be easily controlled by a single fire but in stands of dense fire-resistant shrubs repeated burns over a long period will be required to "wear the shrubs down". However, even when shrubs are controlled, opportunistic burning to combat further waves of shrub seedlings should be built into management.

Shrubs, Fire and Dollars

Mike Young
Division of Wildlife and Rangelands Research, C.S.I.R.O., Deniliquin.

The key points of this paper are that shrubs depreciate the natural carrying capacity of a property; and that this translates through to the net cash income received by graziers because it decreases the number of livestock which can be carried;
- decreases livestock productivity per head through lower lambing percentages and high mortality rates; and increases property management costs by increasing mustering costs, etc. and also by requiring each remaining sheep to cover a greater share of fixed costs.
Many have suggested that fire offers an economic (profitable) way to mitigate these losses (see for example Hodgkinson et al. 1984). By way of several case studies this paper examines this idea.

The Scenarios
The case study is of a typical 4000 ewe Bourke property which was acquired in 1950 and managed under a suite of 'burn - no burn' management strategies. We examined the net cash income received by a man and his wife, who purchased this property soon after World War II and now 36 years later are keen to transfer it to one of their children. The assumed attributes are shown on Table 1.

The questions are would 'Mum and Dad' have been better off if they had burnt when they could and should their son burn in the future? As time is short we will only examine the situation where their son experiences the rainfall sequence from 1986 to 2022 which Mum and Dad experienced from 1950 to 1985.

Assumptions
Our scenarios require us to assume that
- shrubs established when it was wet in 1956 (1992), in 1974-75 (2011) and in 1985 (2021);
- a drought in 1958 came soon after shrubs first established in 1956 which, if one 'burnt' created cash flow problems; and
- there were also droughts in 1965-7 (2001-3), 1972 (2008-9) and 1982 (2018).

Moreover, we assume that each time shrubs established they only invaded 25 percent of the property and that fire would, at a cost, prevent establishment. Table 1 presents the other main assumptions, many will want to change some of the price assumptions but these are unlikely to significantly change the conclusions. The estimates of cash flow...
which result are derived from a computer model which simulates property cash flow and is in the advanced stages of development by C.S.I.R.O. for transfer to the Department of Agriculture as an extension aid (Young and Miles 1985).

Shrubs are assumed to have no effect for the first 5 years and then over the next 10 years reduce carrying capacity by 4 percent per annum and lambing percentage by 2 percent per annum.

Conclusions

Figure 1 presents the cash flow of a shrub-free property. The 'burn' and 'no burn' strategies are then presented as differences in net farm income from this shrub free property for comparison. Figure 2 presents the ongoing story for 1986-2000. The main points which arise are that
— burning to keep country free of shrubs can have significant short term costs particularly if the years which immediately follow a burn are drought years;
— benefits only become substantial some 10 years after the event; and
— continuing on with the same property structure and a no-burn strategy appears to be a course towards bankruptcy.

The question which is one everybody's mind today, however, is having not burnt before what would happen if Mum and Dad's son burnt 25 percent of his country this year and all the remaining shrubbed country (50 percent) at his next opportunity in 1992. The answer is presented in Figure 3.

References


Table 1. Assumed physical and financial attributes of the Bourke property

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Assumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum carrying capacity of open country</td>
<td></td>
</tr>
<tr>
<td>Good years</td>
<td>5904 - 9840 sheep</td>
</tr>
<tr>
<td>Normal years</td>
<td>4920 sheep</td>
</tr>
<tr>
<td>Drought years</td>
<td>2952 - 1472 sheep</td>
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<tr>
<td>Maximum carrying capacity of invaded country</td>
<td></td>
</tr>
<tr>
<td>Good years</td>
<td>3542 - 5904 sheep</td>
</tr>
<tr>
<td>Normal years</td>
<td>2952 sheep</td>
</tr>
<tr>
<td>Drought years</td>
<td>2362 - 1181 sheep</td>
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<tr>
<td>Lambing percentage in open country</td>
<td></td>
</tr>
<tr>
<td>Good years</td>
<td>78 percent</td>
</tr>
<tr>
<td>Normal years</td>
<td>65 percent</td>
</tr>
<tr>
<td>Drought years</td>
<td>6 percent</td>
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<tr>
<td>Lambing percentage in invaded country</td>
<td></td>
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<tr>
<td>Good years</td>
<td>48 percent</td>
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<tr>
<td>Normal Years</td>
<td>40 percent</td>
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<tr>
<td>Drought years</td>
<td>4 percent</td>
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<tr>
<td>Price of wool (at farm gate)</td>
<td>200 cents per kg</td>
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<tr>
<td>Variable costs per head</td>
<td>$4.26</td>
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<tr>
<td>Overhead and fixed costs</td>
<td>$5,000.00</td>
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<td>Wool cut per head</td>
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<tr>
<td>Lambs</td>
<td>2.5 kg</td>
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<tr>
<td>Ewes</td>
<td>4.5 kg</td>
</tr>
<tr>
<td>Wethers</td>
<td>5.0 kg</td>
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<tr>
<td>Cost of each burn</td>
<td>$1,465.00</td>
</tr>
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</table>
Figure 1. Estimated Net Farm Income by year 1950 - 1985 under 3 management strategies on a typical 4000 ewe property near Bourke.

Figure 2. Estimated Net Farm Income by year 1985 - 2021 under 4 management strategies on a typical 4000 ewe property near Bourke.
Figure 3. Estimated Net Farm Income by year 1985 - 2021 on a typical 6000 ewe property near Bourke.

<table>
<thead>
<tr>
<th>Size (Ewes)</th>
<th>Control</th>
<th>Burn suitable years since 1950</th>
<th>No Burning</th>
<th>Start burning 1985</th>
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<tbody>
<tr>
<td>4000</td>
<td>17232</td>
<td>15704</td>
<td></td>
<td>Broke 1998</td>
</tr>
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<td></td>
<td>Broke 1999</td>
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<td>6000</td>
<td>31877</td>
<td>30487</td>
<td></td>
<td>Broke 2017</td>
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Figure 4. Average net farm income during period 1985 - 2021
Prescribed Burning Technology

Ross O'Shea
Department of Agriculture, N.S.W.

Prescribed burning is a management strategy which can maintain or increase productivity on shrub infested rangelands through plant community management. A prescribed burn is a safe, contained and managed fire. A wildfire is not a prescribed burn as wildfires are neither safe, contained or managed. Experience with wildfire is often not adequate for conducting a prescribed burn.

One of the key elements in prescribed burning is early planning. It is imperative to plan prescribed burning into the overall management strategies for a property. Graziers must become familiar with the plant communities present in their paddocks; they must be able to recognise a "shrub germination event" as soon as it happens, not 5 years later when sheep cannot be seen behind the 80cm high shrub seedlings. If grazing management must be changed to conserve fuel for burning then so be it. It is useless to plan a burn, prepare breaks, assemble men and equipment and then only get a 15% burn out because sheep have removed too much fuel.

Using prescribed fire is not difficult, nor need it be an expensive operation. True, some form of fire break is necessary but depending on the Fire Danger Index these can vary from a Brompton Rat Track to a 40 metre break.

What is the Fire Danger Index?
Fire Danger Index gives a measure of fire intensity and rate of spread of the fire. The Fire Danger Index is determined from measurements of:
- Temperature
- Humidity
- Wind Speed
- Fuel type and amount

Fire Danger Indices are higher in summer and lower in winter. Winter fires with lower intensities require far less fire break protection than high intensity summer fires.

However, it is important not to forget the aims of prescribed burning, which are:
- To achieve high shrub mortality
- To achieve as large as possible burn out of the paddock.

This is where the tradeoff between cost, safety, and results occurs. Winter fires may be cheap and easy but may not meet the aims of control whilst summer fires may meet the aims of control but at a greater cost.

Obviously spring and autumn are the times when the ability to have safe cost effective burns is greatest.

I would urge graziers to discuss this particular aspect of prescribed burning with a Department of Agriculture Officer who through an examination of the paddock plant community, fuel amount and type, and the management constraints or desires of the grazier, can give advice on what can be expected from prescribed burning and what inputs to the fire will be necessary.

The anticipated fire intensity and the proposed area of burn will also determine what resources will be required for the burn, keeping in mind that a safe, controlled and managed burn is required. These resources can include:
- Manpower - at least 2 men per fire unit
- Equipment - fire units, graders, tankers, drip torches
- Communications - between controller and units
- Availability of water

A Special Note on Equipment
I cannot stress strongly enough the need to ensure that fire equipment is in top working order. If there is a break out at a fire it is easily handled and controlled in first few minutes after it occurred and this is why equipment must operate reliably as soon as possible.

As a rule vehicles give no trouble, it is with pumps, tanks and hoses where problems occur. Please check your equipment prior to the fire not on the morning of the fire when everyone is ready to start.

Carrying Out The Burn
Prior to actually lighting the paddock there a number of procedures to carry out to ensure the orderly running of the burn. These include:
- Mapping the area and identifying key positions on map and on the ground.
- Give each unit a unit number to allow easy communications and identification.
- Give each unit a copy of the map of the burn area.
- Decide on and make everyone aware of the tactics to be used throughout the burn.
- Ensure the communication network is operative.
- Ensure that everyone is aware of their role.

These notes are, by necessity, general because every burning situation is different. If you wish to use fire or learn how fire can be of benefit to you please contact a Department Officer who will discuss aspects of burning that are more pertinent to your own situation. The Officer will also advise on Western Lands Permit requirements, methodology for prescribed burning, anticipated fire intensities and make suggestions on appropriate fire breaks.

Prior to burning it is essential to:
- Contact your local bushfire captain (and obtain a permit in bushfire periods).
- Notify your neighbours.

Prescribed burning is a low cost, effective tool for shrub management however, never forget that whilst fire is a useful ally it is a very dangerous enemy.
The Arabella Grazing Trial - A Summary

Ian Beale
Charleville Pastoral Laboratory, D.P.I.
Charleville, Queensland

Pasture Growth Patterns
In the Charleville area, grass provides the bulk of forage for grazing animals. Winter rain encourages broad leaf plants which are high in nutrition but low in yield and do not last over summer. Grass growth in winter is limited by temperature. Thus feed available at the end of summer (April) represents about 90% of the forage available until the next summer rain.

Grazing Responses (1978-84)
This knowledge of pasture growth patterns was used in a trial on mulga country where stock numbers were adjusted in response to the amount of forage available at the end of summer. Paddocks were stocked so the wethers would eat 20 percent, 35 percent, 50 percent or 80 percent of the end of summer forage in the next 12 months.

By 1984 the following results were evident:
- The lightest stocking rate produced similar wool production per ha to the heavier treatments.
- It had lower fluctuations in numbers of animals grazed.
- It had increased pasture yield (nearly double the next best treatment).
- It encouraged desirable grass species and discouraged undesirable (particularly wire grass).
- It maintained ground cover (basal area) at around 2 percent needed for stability in the pasture. Heavier treatments have lower basal areas.

Mechanical and Chemical Treatments for Shrub Control

Phil Fogarty
Soil Conservation Service
Bourke, N.S.W.

Mechanical clearing and herbicides provide two alternatives to fire in shrub control.

These methods are expensive and require follow up treatment to contend with growth and seedling establishment.

The Soil Conservation Service is interested in investigating various mechanical treatments in order to develop techniques of rehabilitating degraded land caused by shrub infestation.

The Western Lands Commission in conjunction with Du pont Chemicals, and more recently the N.S.W. Department of Agriculture, have initiated work with Velpar to determine its effectiveness on woody weeds along with costs and application strategies.

Mechanical Treatments
There are many forms of mechanical clearing. The effectiveness and costs vary with the type of country, size of machinery and whether work is carried out on a contract basis or by owner-operator.

Removing above ground vegetation is insufficient to kill shrubs. The theory stands however that by clearing competition between shrubs and pasture is reduced and the resultant ground layer will provide fuel to burn as a follow up treatment.

Clearing in this way may be by blade, chaining or rolling. Alternative methods being investigated locally are deep cultivation by blade plough. Similarly, reduced competition should enhance pasture production. The advantage with this deep cultivation is a better percentage kill as the bowl of shrubs is lifted from the ground. Much depends however, on the species present and the timing of rainfall after treatment.

The application of mechanical treatments is in special purpose areas such as holding paddocks, watering points and laneways. The major drawbacks are access to machinery, the need for follow-up treatments, soil disturbance and of course, cost.

Herbicides
Velpar has received considerable interest as a broad-spectrum herbicide which prevents photosynthetic activity in plants. Applied by point application Velpar is very effective in killing most species of problem shrubs.

There are various applications to which Velpar ideally lends itself. These include knocking out shrubs along fencelines, in yards and around gates to improve access and mobility. Very important also is the need to kill shrubs which remain after fire and therefore reduce seed production.

The use of chemicals to reduce shrub density over large areas is impractical and very costly. Applying herbicide to scattered shrubs and isolated clumps throughout a paddock however is a prudent move to prevent a future shrub problem.
FEATURES

Reclaiming Ridge Soils

Darryl Green and Peter Walker
Soil Conservation Service of N.S.W.

Severely sheet eroded areas in the Cobar district of western New South Wales have been effectively revegetated by the use of contour furrows.

Ridge soils in this region, which in the past has been degraded by overgrazing, display very low productivity. Measurements have shown that in some years, less than 5 percent plant cover is present and even during prolonged good seasons, cover rarely exceeds 20 percent.

The soils on the ridges are known locally as hard red soils. On most of them a layer of thin clay seals the surface, preventing seed lodgement and moisture penetration. Seeds and litter falling on the soil are easily removed by wind or water, thereby reducing seed source for regeneration.

Observation at the Cobar Experimental Area showed that over 80 percent of the rainfall from a single storm can be lost from the ridges by runoff. Measurements reveal that the average annual runoff over an extended period was approximately 40 percent of the total. It has been shown that about 40mm of rain is required to increase soil moisture to levels adequate for plant growth on a bare, eroded ridge soil. Even then, the soil moisture remains above this level for less than 14 days after the rain, indicating the difficulty of plant establishment and survival in this environment.

On untreated ridges, pasture tends to grow mainly in rill lines and drainage areas where water and silt accumulate, and on small areas of more absorbent residual soils.

Contour furrows, by breaking the surface seal and forming a hollow in which water, seed and silt are trapped, create favourable areas for germination and growth of pastures. Furrowing has increased the sheep carrying capacity of the Cobar ridges to 5 or 6 times the local average.

Furrow Construction

Furrows are best constructed by a ripper with a mouldboard attachment. A normal ripper is not effective, as the soil is not removed from the furrow and the ripped line rapidly seals during rain, enclosing the hollow. The recommended implement produces a furrow and a bank which effectively traps seeds and water and is more resistant to slaking. It is immaterial whether the bank is built uphill or downhill of the furrow since moisture is trapped within the bank-furrow in either case.

Furrows are formed on the contour, with one or two metre gaps spaced approximately every 50 metres to prevent the loss of ponded water should a lengthy furrow be breached in one place.

Spacing will vary with climate, slope and soil type, but in the Cobar district furrows should be between 1.5 and 3 metres apart, down the slope. There is some evidence that furrow spacing may be used to manipulate pasture types. Furrows 1.5 metres apart appear to encourage growth of annual medics, trefoils and saffron thistle, while wider furrows encourage perennial grasses such as wire grass, wallaby grass and umbrella grass. The main disadvantage with closely spaced furrows is the additional cost, as more ground has to be covered to build the furrows.

Implements

Mouldboard rippers have shown best results in forming banks and furrows. Angled grader blades also perform well, while implements such as chisel ploughs, tyne pitters and disc pitters have shown favourable results on some types of country. For the hard ridge country, these latter machines have only a limited application.

The main advantage with disc or tyne pitters comes from the fact that operations need not be carried out strictly on the contour, thus saving time and survey work. However, the benefit is usually outweighed by inadequate penetration of the soil surface by these machines.

Spelling

Studies have shown the benefit of allowing pastures to develop in the furrows entirely free of grazing pressures. Country spelled for two and five years at the Service's Cobar site produced similar average pasture cover, whereas areas spelled for less than 18 months produced much lower average plant cover.

This indicates that newly treated areas need to be spelled for at least two years and, depending on seasonal conditions, possibly longer. After an initial spelling it is recommended that furrows be periodically spelled to allow growth and seeding of preferred species. This will help maintain their vigour in the pasture and to combat undesirable species more effectively. Strategic stocking may be used to manipulate pasture types. There is some indication that the grazing of furrowed areas during summer and autumn will assist in the development of a winter spring pasture (annual medics etc.) and that grazing during winter-spring will assist in the development of perennial grass pastures, most of which are summer growing. This is particularly significant when establishing improved pasture.

Effectiveness

Prior to furrowing the Cobar experimental site, the area had less than 20 percent plant cover, with vegetation restricted to favoured locations. Since then, the treated areas have developed up to 75 percent cover, with 50 percent cover being consistently maintained.

In terms of sheep-carrying capacity, the treated areas have successfully carried adult wethers at a rate of one sheep per 2.3 hectares for over eight years, while the effective carrying capacity of some paddocks has been as high as one sheep to less than 1.5 hectares. This was carried out under a "best pasture" rotation which allowed pastures to re-establish for a period after grazing. Prior to furrowing, the accepted stocking rate was one sheep to 10 to 12 hectares.
When the Cobar site was fenced, only 20 species of ground plants were recognised but eleven years later, there are 119 in the area. This gives a much greater flexibility in the pasture with regards to species choice by stock, and the possibility that with adequate rainfall, some species will grow at any time of the year.

In marked contrast to results on the furrowed land, the areas enclosed but not furrowed did not respond to for over ten years, even though that period included some very good seasons.

Free Advice

Further details of the furrowing technique, together with assistance with surveying, can be obtained by contacting Soil Conservation Service offices at Cobar, Condobolin, Bourke, Nyngan, Broken Hill, Buronga and Hay.

(N.B. This material first appeared as Soil Note 8/83 from the Soil Conservation Service of N.S.W.)

A typical bare, hard red ridge in the Cobar area.

Newly constructed furrows showing the small bank which enhances water and seed retention.

This revegetated ridge in the Cobar experimental area was treated with contour furrows ten years previously.
Land Ethics and the Pastoral Industry

Brian Roberts
Darling Downs Institute of Advanced Education,
Toowoomba, Qld.

Having been brought up pushing a wheel-point apparatus, I am aware that the debate on soil conservation concentrates on farming rather than grazing land. It’s my guess however, that in absolute terms soil losses in Australia are greater from the latter lands. For this reason it could be useful for us in the rangeland scene to consider a few of the fundamentals relating to land degradation.

In my struggle for a solution to the erosion problem over thirty years I repeatedly return to attitudes to the land, as the fundamental issue in need of change. The conviction that the key issue which ordinary Australians should appreciate is the basic Man/Land relationship, has led to this overview concentrating not on the hard data of soil losses in terms of their production or socio-economic implications, but on the deeper values we place on land as our national foundation. When presenting a stark analysis of the ecological realities which face Australia today, it is predictable that one will be accused of emotionalism or even alarmist scare tactics. It is my firm belief that we need to re-consider the factual basis of our apparently apathetic optimism and recognise the significance of the realities which confront our rural development.

A useful starting point is Bolton’s “Spoils and Spoilers” which reminds us of agricultural developments and their attendant attitudes at the turn of this century.

Like their fathers before them the pioneers of the new farming districts cleared the land with indiscriminate zeal, spurred by the urge to render every acre productive and to leave no sanctuary for vermin such a wallabies and rabbits. Soil erosion and salt creep were the consequences.

In the late 1920’s and 1930’s complaints grew rife in Sydney about the heavy dust storms thrown up by the summer westerlies. The public at large came to realise that much of the New South Wales wheatbelt’s topsoil was being steadily blown out across the Tasman. In 1933 a government committee was set up to monitor the problem, and in 1938 a soil conservation service was created to survey its extent. (Bolton, 1981).

Land Condition as an Issue

It has repeatedly been pointed out by protagonists of soil conservation (Roberts, 1984), that erosion is not recognised as an environmental issue of any significance. In an unusual survey of newspaper coverage of issues, Sinden (1980) analysed the space given to environmental subjects in Australian newspapers over a full year. In that year (1978) 1150 environmental articles (averaging 3.9 per day) were published but neither land degradation nor soil erosion rate a mention in the listing of issues or their ranking.

It is the author’s view that a major deficiency still exists in the extent to which rural producers organisations are not accepting their share of responsibility for soil conservation. Who will speak for the land, if those who depend on it, do not speak? We need to analyse why there is no effective political lobby for soil conservation and take corrective action without delay.

The Global Picture

In 1974 the author addressed extension officers as follows:

Despite numerous warnings over the years, man has recently been somewhat bewildered by the fact that Nature has slapped him in the face for insulting her ecosystem.

The time factor has become a crucial element in our efforts to control land degradation. If we do not get on top of the problem soon, we shall have little hope of winning the battle against erosion in several regions. Under the circumstances, perhaps the local politician who suggested in 1983 that the Declaration of a State of Emergency was not as absurd as some thought at the time. As Jacks and Whyte (1939) pointed out when referring to the Australian situation “… the only way to combat erosion is to work faster than it does, and this becomes increasingly difficult as time goes on”. Osborne and Rose (1981) have demonstrated the general rate of land deterioration by comparing earlier estimates with the latest erosion surveys. In 1946 Holmes estimated that Australia had 18.8 million hectares of water eroded land, requiring erosion works valued at $24.5 million. By 1975 the national erosion survey (Anon. 1978) reflected an area of 57.7 million hectares requiring $441.5 million for control works.

Size of the land degradation problem in Australia

The significance of soil loss, and the need for a change in our attitudes towards the land is reflected in the findings of the national soil conservation survey (Anon. 1978): “Fifty-one per cent of the total area used for agriculture and pastoral purposes in Australia was assessed as needing some form of soil conservation treatment under existing land use. The total value of fixed investment in this area subject to degradation is of the order of $12 billion (at 1974 prices)”.

Osborne and Rose (1981) quote Kovda’s (1977) estimates of Man having destroyed 430 million hectares of crop and grazing land since agriculture emerged 7,500 years ago. They point out that on a per capita basis, Australians have destroyed 11.2 hectares, compared to 3.5 hectares in the U.S.A. since settlement.

Education and Attitudes

We might start with James Thurber’s suggestion, that is: “Let us not look back in anger, nor forward in fear, but around in awareness.” I would add, “not with arrogance but with humility, not as though we were the last generation to inhabit the earth, but as temporary trustees of posterity’s resources” (Roberts, 1984).

Conservation is essentially a concern for the human species. Ecological action, in the long run, can only be based on compassion, respect, understanding and a willingness to share with others. Not, “The land belongs to us” but “We belong to the land”. Not “We are conquerors of the earth” but “We are a part of the
It is generally recognised that the acceptance of a comprehensive conservation programme throughout the nation requires a combination of financial assistance, regulatory guidelines and extension. If extension is broadened to include education from adults down to young children, a number of specific aspects of such an educational programme may be considered. The writer suggests that the following 15 Point Education Plan is worthy of implementation in Australia in answering the fundamental question, "What should we teach?":

1. We should teach that the dominating and consuming approach to our non-renewable resources is short-sighted and has caused failures of civilisations through history. We should proclaim the truism that a rising standard of living cannot be built on a falling level of soil fertility. Thus our view that Nature is there primarily for Man's use should be re-considered to include non-monetary values.

2. We should emphasise that conservation does not necessarily imply non-use or protection for its own sake. It means maintenance of productive potential, by marryng economic and ecological realities, as in the National Conservation Strategy.

3. We should teach that good farmers are in fact good applied ecologists, for both seek to harvest nature at a level that can be sustained by ecosystem equilibrium.

4. We should teach that Man is not an independent controller of Nature, but an integral part of the global system on which he depends. It is a lack of awareness of this interdependence that has caused the environmental problems which the world presently faces.

5. We should teach that environmental problems are complex and require national and international solutions - that our planet is a closed system where actions and reactions are of global proportions.

6. We must bring home to coming generations the old Greek adage that what men learn from history is that men don't learn from history - that each generation seems doomed to have to learn its own lessons on ecological behaviour, unless we learn to read the signs.

7. We must avoid the despair and gloom which so easily arises from consideration of environmental problems and we must teach the optimism and challenge which is demonstrated by the successes of dedicated and persevering individuals and organisations.

8. We must teach that even in our democracy, the common good of the community takes precedence over the unfettered freedom of the individual to act irresponsibly towards the environment.

9. We must stress the need for political ethics in our system of government, together with the desirability of more vision and less expediency, more permanence and less exploitation.

10. We should emphasise the links and interdependence of landholders and city dwellers, of taxpayers and consumers, in such a way as to develop an understanding of resource conservation as an issue concerning the whole community.

11. We must demonstrate case-studies which bring home the disasters of poor land management and the achievements of sound planning as a basis of sustained stable production.

12. We must imbue in the next generation a pride in good stewardship of the land, a lasting satisfaction from well-husbandred land. The spiritual well-being which flows from such fundamental achievement should become an integral part of our national ethos.

13. Together with a national pride in conserving non-renewable resources, should be acceptance of a land ethic which not only values our good fortune but develops an awareness of others less fortunate and how we might share our good fortune.

14. We must emphasise that as a resource-rich western nation set in the eastern arena, we have grave responsibilities which accompany our role as trustees of such natural wealth.

15. Finally we must teach the place of Man in the grand scheme of things - that we are on this earth for but a fleeting moment in the life of the land. As such we cannot be end-users with a right to consume the potential of the land. Rather we have the privilege of using the land and leaving it in a better condition than we found it (Roberts, 1984).

I suggest that in our efforts to develop a Land Ethic in our nation's values, we be guided by John Ruskin: 'The earth is a great entail. It belongs as much to those who come after us, as to us, and we have no right by anything we do, to involve them in unnecessary penalties, or to deprive them of benefits which are theirs by right.'
**References**


**“Pastoral Challenge ’85” — A Report on a Seminar**

Gary McKenzie
Department of Agriculture
Derby, W.A.

More than 150 people attended the seminar held in Derby on the 11th of April and organised by the Primary Industry Association of Western Australia. The Honourable Brian Burke, Premier of Western Australia, officially opened the seminar. Furthermore, he explained the Governments position in relation to the Alco and Emanuel properties. Alco properties will be purchased by the Government for 8.5 million dollars, restructured and reallocated. A further 12.5 million dollars will be spent on development of these leases. (No time period was mentioned).

He also stated that Fox River Station and a part of Ord River Research Station will be sold to interests in Sarawak. Negotiations are still taking place, but should be finalised shortly.

The first and most controversial paper was presented by Dug Halleen (Pastoral Consultant). To quote from the opening paragraphs “This paper is recognised as being contentious and has been designed to be provocative to draw attention to the confronting problems that exist within the Kimberley cattle industry today. It is hoped that the following comments extract some constructive criticism that will result in remedial action being taken to make the industry a more viable and productive operation.

It is obvious that a percentage of the Kimberley pastoralists and grower bodies have their heads in the sand and it is time they reviewed their antiquated methods of operation which are accounting for poor herd control. The sooner they realise they are functioning in 1985 and not 1885, the sooner the industry will respond in a productive viable way” unquote.

He went on in a similar vein discussing the problems of the Kimberley cattle industry and presented his own remedies. Some included the TB Eradication Programme and the need for producer co-operation and improving cattle management by introducing fencing and watering systems. Dug believes that an experimental programme should be developed on Ord River Research Station to test out the developments suggested.

On lease tenure, he suggested the lease should be granted on 3 categories:

1. The incoming leasee taking on a new undeveloped or run-down lease should be given a 5 year lease. If he complies with laid down development requirements, he would then move to stage 2.

2. Conditional purchase lease which would carry a life of 10 years with development conditions to apply and if conditions are adhered to, then would move on to stage 3.

3. Perpetual lease with a special title and would indicate to lending bodies the the property was held in high regard with limited risk factors.

Peter Buckman presented a situation paper on Tuberculosis in the Kimberley. The take home message being “the challenge for Kimberley pastoralists and the Department of Agriculture is to design and operate programmes, within the minimum guidelines that will eradicate TB and still maintain station viability”.

Peter Murray (Kimberley Pastoralist) had a different attitude when he presented his paper. “The Future Turn-off”. He described the present B.T.E.C. programme as a financial disaster for the pastoral industry and predicted that the pastoralists will probably be eradicated with the disease.

Peter stated that he believes that cattle turn-off will decrease after the next 5-8 years, and that pastoralists will need to take financial risks if their situation is to be turned around. As well, he said that there needs to be changes in the Land Act; a new approach to money lending from financial institutions; and a firm commitment from government to help get rid of the problems and not create them.

Brian Jennings (Chairman, Pastoral Board of W.A.) listed the ways in which the Government has committed itself to helping the industry. Firstly by restructuring, which has been initiated by the Kimberley Pastoral Industry Inquiry (K.P.I.I.). The report has just been released for public opinions. Secondly by appointing a study group to examine the question of a more
meaningful land tenure which will help stabilise the industry. All aspects of land tenure will be considered by the group, with security being fundamentally important.

At present, more than one third of pastoral leases do not have long term security mainly because their leases comprise low carrying capacity country and cannot run enough cattle to maintain viability or become viable, given the inescapable cost/price squeeze.

The Department of Agriculture had several representative speakers. David Wilcox (Principal Adviser Rangeland Management Branch) talked about rangelands and their use as a finite resource. "They are not a resource which will be there till the end of time unchanged and still productive". The land user and administrator need to develop a land care ethic to ensure the land is an enduring resource. This land ethic involves the proper management of the rangeland by setting stocking rates at a profitable level for the pastoralist and at the same time beneficial to the pasture. Monitoring pasture properly so that change is accurately recorded is the principal tool for the pastoralist in his effort to maintain the finite resources of the range.

Doug McGhie (Officer in Charge, Kununurra Office) informed the audience on the findings of the Department's research work in the Kimberley. From the genotype work done at Ord River, Brahman/Brahman cross performed the best in all of the characteristics measured. The Leucaena work done on Kimberley Research Station look promising with weight gains of 140kg over 220 days at a stocking rate of 3.5 beasts per hectare. Further work is being done on increasing stocking rates and leucaena intake. Other research projects are underway and few results have come to hand.

Graeme Robertson (Commissioner for Soil Conservation in W.A.) painted a further picture of gloom. The degradation of pastoral land has occurred on a very large scale in the Kimberley. Two areas in particular are the Ord River and the Fitzroy River frontages. Ord River degradation has partly been rejuvenated but still needs considerable work. The Fitzroy regeneration is only just starting from preliminary research - the problem is immense.

It is only recently that Kimberley pastoralists have become aware of the condition of the land and the need to improve it. The land user must have a husbandry attitude not an exploitive one.

Other speakers include Ernie Bridge, M.L.A. for Kimberley who, like many people, has the view that pastoral leases in the Kimberley are too large and need to be smaller so that individuals (families) rather than large companies can manage the industry.

Elders and Westfamers representatives described their role in servicing the industry in the area. Elders have committed themselves to servicing the industry by constructing a new outlet in Derby. The community is pleased to see them in the Kimberley and wish them all the best in the future.

Many other speakers presented papers with varied topics: Banking, Beef processing and marketing, Aborigines, and the proposed A.P.B. Kimberley checkpoint. Further information on these topics and others can be obtained from the Primary Industry Association in Perth.

Norm Halse, Director of Agriculture, presented an overview of the proceedings, highlighting the many problems in the industry has and the need for industry and Government to work together and overcome them before the cattle industry in the Kimberley disappears.
Currently in Australia there is administrative revival aimed to restore the nation's pastoral grazing lands. In Western Australia for example, the general thrust of this revival is 1) to strengthen central scientific bureaucracy through expanded deployment of salaried conservation experts, and 2) to establish district committees of farmers and graziers.

**Current Administrative Model**

The implicit model of thought behind this new administrative thrust consists in brief of the following elements:

1. Graziers are ignorant about causes and remedies of vegetative degradation; they are inadequately sensitive to conservation values; and they are motivated by short-run financial profits to the exclusion of long-run ecological requirements.

2. By and large, causes of vegetative deterioration are understood by the scientists; remedies are similarly understood; and vegetative restoration is an extension problem which can be overcome by more pasture extension personnel backed by administrative clout in the form of an Act, and by grazier committees to exert peer-group pressure on recalcitrant neighbours. Also, such committees are velvet gloves for the possible iron of the bureaucracy.

This administrative approach contains the seeds of its own failure. But let me start at the beginning.

**Current Realities**

There is widespread degradation of pastoral grazing lands in Australia. This is associated with grazing management. The cause are managerial, not natural, though once initiated natural processes exacerbate managerial practices. This thinking leads to asking what are the managerial objectives of graziers?

Managerial objectives are many, they differ widely between graziers at any one time, and they change over time. These objectives are influenced by economic circumstances, financial situation, and technological constraints and opportunities concerning each separate managerial grazing unit. More-over, whatever the objectives and influences on them for any one grazing property, the net results from hundreds of properties together is pastoral deterioration.

To remedy this the administrative expert, who usually is a graduate from the scientific bureaucracy, wants administrative planning for and of graziers based on land and vegetative evaluation according to capability and suitability, and enforcement of leasehold conditions; the researcher sees more research as the sine qua non of restorative practices; the technological educator (extension officer) wants graziers to be more conservation-minded; and then there is the farm management expert.

Where the farm management expert or conservation economist is not independent of the conservation experts, (the latter usually are scientific technicians and are in charge of "Conservation"), he is likely merely to rubber-stamp the technical requirements of his bureaucratic superiors. Where however, he is one of a group of conservation economists or has some independence, he sees the economic system within which grazing management operates perforce, and its domination of the ecological system. Also he is inclined to see futility in administrative attempts to impose ecological requirements onto an economic system without requisite economic incentives which are the mainspring of grazier managerial activities. And this expert has some understanding of the confounding effects of variable seasons, fluctuating prices and yield-increasing technologies on degenerative and regenerative practices.

Finally, there are some enthusiastic conservation-minded graziers, often most knowledgeable about their own pastoral conditions, willing to help the scientific bureaucracy in the development of some of its meagre resources.

Implicit in the foregoing is a highly centralised administrative scientific model earnestly dedicated to restoration and regeneration aided by district grazier committees all wishing that managerial grazier objectives were more closely in accord with conservation values.

My quarrel with this is not with its obvious good intentions but with the latent stagnancy within the whole administrative edifice. What alternatives you may ask.

**Perspective to an Alternative**

The basic fact is that to the reverse deterioration and destruction of grazed natural vegetation requires managerial action on thousands of pastoral grazing properties, not committee resolutions in capital cities. This implies extreme localism and widely dispersed effectiveness within the frame of continued economic viability. To talk of what graziers must do and to enforce conditions without ensuring economic viability is to expect the impossible and basically "explains" why, in Western Australia, the conditions of pastoral leases have not been enforced by the government landlord. To say (as has been said by the conservation bureaucrats) that the occupier is responsible (while the lessor looks on helplessly) is a naive cop-out.

The centralised administrative approach outlined here, implicitly be basically, divorces conservation and management whereas the need is for their integration. Typically the conservation branches, divisions, sections or what-have-you are administratively distinct and separate from the part of the bureaucracy which administers agricultural economics and farm management in Departments of Agriculture. Vegetative deterioration, degradation and destruction, and regeneration and restoration all are managerial practices on thousands of grazing properties. Deterioration is an integral part of management and its revers on the property cannot be otherwise whatever it is in the bureaucracy.
Only “out there” on thousands of individual managerial units can restoration, regeneration and conservation be integrated with the harsh and unforgiving realities of the economy from which no grazier can escape however fondly he may think of tomorrow’s unborn generations and however enlightened his attitudes on conservation values. So what, you may ask.

An Alternative

District grazier committees have merit. They can exert fruitful peer pressures and they do have a part to play in developing a strong local conservation ethos. But if such committees are not to fall apart after the first flush of enthusiasm they must be fiercely independent and local and not dither between a craving for status with the Minister by being in effect his and his department’s agent and getting on with the job.

Accordingly, such district grazier committees should be local: elected locally, funded locally (but subsidised!), and responsible policy-wise for locally employed expertise serviced (not employed) by the Department of Agriculture. Under the proposed organisation the local problem is locally wrestled with with help from the centre which is the upside down of the current arrangements and proposals whereby a chosen few locals help the centre to solve the problems of locality more in lip-service fashion than less.

Such district grazier committees would have real responsibility as an integral part of one or several existing local government shires. They would be unable to divorce conservation from management. They would learn how more closely to harmonise economy with ecology which is political in the final analysis which partly is why closer harmonisation is unlikely where the administrators and bureaucrats are in charge.

There should be a vegetation regeneration rate struck locally, administered and spent locally, to employ expertise where needed, and perhaps to subsidise centralised Department of Agriculture facilities into local situations.

With local elections, with local money to be spent and subsidy money to be spent locally and with requisite expertise paid for locally with subsidy, district grazier committees would have bite and Departments of Agriculture would seek to service them. This again is the upside down of such Departments generating the formation of such committees to service them!

As a case in point concerning the administrative present centralised approach to vegetative improvement I refer you to Rangeland Management Newsletter No. 84/3 August 1984. Here you will read of two typical centralised bureaucratic ideas. One is “several Australian rangeland scientists are planning to visit the U.S. and study the Savoury grazing methods with a view to assessing its applicability to Australian conditions”. A couple of relevant scientists is perhaps OK provided that they are accompanied by several experienced graziers who are chairmen of graziers district committees!

The second concerns an alleged need for training (formal) to produce a “land ethic” and for pastoralists to have an “overview of range management, and to aim at the long term stability and the future of rangelands”. The education bureaucracy is looking for things to teach and education for conservation and regeneration, etc. now is an Australian motherhood issue!

Reorientation?

One place the conservationists apparently refuse to look for solutions is in the economy within which the primary aim of graziers is financial survival. Here again only the realism of local situations can be the matrix for effective and widespread remedial action. But presently the administrative and scientific bureaucracy is looking elsewhere and it will not succeed until it reorientates its gaze.

NOTICES

Books
Wool Harvesting Notes - Australian Wool Corporation

The Corporation has reprinted the ‘Wool Harvesting Notes’, the collection of ideas, plans and detailed drawings spanning every aspect of sheep and wool handling buildings and equipment.

In two volumes, the ‘Wool Harvesting Notes’ were compiled by sheep and wool specialists from State Departments of Agriculture and the Melbourne University Agriculture Engineering Section.

Some 400 pages of photographs, plans, working drawings and text are presented in two loose leaf folders. Copies are available for $40 a set from:
Australian Wool Corporation,
Communications Department,
GPO Box 4867,
Melbourne, Vic 3001.
Dear Mr Payne

I, Prof/Dr/Mr/Ms .......................................................... (State and Country)

apply for membership of the Australian Rangeland Society and agreed to be bound by the regulations of the Society as stated in the Memorandum and Article of Association in existence from time to time.

I enclose $A20/25* (full membership) or $A10/15* (partial membership for Range Management Newsletter only) being my subscription for the year 19 ...... .

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