MEAT & LIVESTOCK AUSTRALIA

on farm

Restoring the condition of degraded black speargrass pastures in southern speargrass zone

SWAMP: Speargrass, Wiregrass, Animal Management Project

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ABSTRACT

This project addressed the problem of wiregrass (*Aristida spp*.) and other unpalatable pasture species dominating in commercial black speargrass (*Heteropogon contortus*) pastures grazed by beef cattle in south-east Queensland.

Three treatment paddocks:

(a) control stocked at commercial rates and unburnt;

(b) burnt each year in spring and stocked at half the commercial rate; and

(c) burnt each year in spring and cattle removed for a period of the growing season,

were demonstrated in large paddocks on four commercial beef properties.

Close involvement by the property owners and many of their district neighbours (up to 20 at each of 4 sites) in the planning, data collection and dissemination of results resulted in the ownership and adoption of findings and management principles: these were, that reduced stocking and regular burning of native pastures can improve pasture composition and profitability.

EXECUTIVE SUMMARY

This project addressed the problem of wiregrass and other unpalatable pasture species dominating in commercial black speargrass pastures. Lack of fire, extended dry periods and increasing grazing pressure gradually brought about the changes resulting in poor pasture composition on many commercial properties. The project successfully demonstrated known principles for improving pasture composition at a commercial scale.

The main outcome for industry has been a realisation or confirmation that pasture burning associated with flexibility in stocking rate may lead to better pasture composition and better individual cattle production, with improved economic returns.

Project sites and producer involvement

Four sites were selected and established on commercial properties in the southern speargrass zone. These were: "Glencoe", Monto; "Derarby", Mundubbera; "Corrunovan", Proston; and "Stanley House", Esk.

A group of up to 20 producers were associated with each site. These producers were involved in project planning, decision-making, implementation, data collection and information dissemination.

When the project began in late 1993, there was a large difference in pasture compositions at the four sites. Speargrass comprised as little as 1% of pasture yield at Glencoe and as much as 39% at Corrunovan. Wiregrass ranged from 6% of yield at Derarby to 75% at Glencoe. Another unpalatable grass in the South Burnett, canegrass (*Arundinella nepalensis*), comprised more than 30% of yield at Corrunovan. The pastures would be classified as being in lower B or C condition using the ABCD Framework (Grazing Land Management workshop, EDGE*network*®).

At each site the original paddock was subdivided into three paddocks. One was a control, with the same grazing management previously used on the property. The second was burnt and grazed at half that stocking rate. The third was burnt and grazed at strategically-adjusted stocking rates. The group of producers associated with each site decided the details of the third treatment.

Outcomes

- The project maintained strong producer involvement in decision making and planning. This lead to greater acceptance and adoption of the demonstration outcomes by participating producers.

- A review of the project, commissioned by MLA, found:

  "The project has been successful in achieving its objectives and in particular:

  - Has enabled producers to make better decisions about their pasture and stock management through the knowledge they have acquired of the principles involved.

- Has shown that restoration of degraded speargrass pasture to a sustainable speargrass pasture is practically feasible on commercial properties, and quantified the cost and time to do so.

- Has demonstrated that producers and researchers/extension staff can form a dynamic partnership when each group has a key role in the conduct of the project at hand."

- Pasture composition recovered well at Derarby in both of the burnt and lightly grazed treatments. The heavy stocking rates used commercially meant that cattle liveweight gain responses to halving stocking rate were significant – liveweight gains averaged 96 kg/head/year in the unburnt control and 154 kg/head/year in the burnt paddock stocked at half the commercial rate.

- At Corrunovan, the amounts of wiregrass and canegrass increased in the paddock where fire wasn't used.

- At Glencoe, the frequency of occurrence of black speargrass gradually increased from 9% in 1994 to 38% in May 2000.

- Weight gains per head were highest in the lightly stocked paddocks at all sites, the difference being dependant on how heavy initial stocking rates were in the controls – heavier stocking rates reduced liveweight gains per head.

- Data from the sites was used to model the economic returns from breeding enterprises typical of the Burnett and producing either store steers or older steers for finished markets. The outcomes showed that running fewer cattle and allowing pasture condition to recover could improve gross margins by 13% when store cattle production changed to higher value cattle for 'finished' markets.

- Field days held throughout the project attracted wide interest and helped with the dissemination of results and information to a broader audience. The effect this had on changing attitudes and management of producers outside participating groups remains unquantified but could be significant. Comments from some producers not involved directly in the project suggest a shift in attitudes in relation to the importance of native pastures.

Conclusion and recommendations

- The project has demonstrated how DPI&F extension staff and producers can be highly effective in conducting demonstrations of known management principles.

- The project model could be used to demonstrate other management principles and outcomes of research.

- The information from this project be synthesised into the Grazing Land Management package to demonstrate principles of pasture and cattle management to a wider audience.

Acknowledgments

Financial support from the Meat and Livestock Australia is gratefully acknowledged.

This project could not have proceeded without the involvement and generosity of the co-operating producers, the Grimes family (Corrunovan), Ross and Joan Elliott (Derarby), Pat and Janelle Connolly (Glencoe) and Vince, Joan and Charles Burke (Stanley House). Their support is gratefully acknowledged.

The project would not have been so successful had it not been without such a high degree of producer involvement, not only from the co-operators but also the group of producers associated with each site. This support was invaluable and is acknowledged with pleasure.

So too is the support given by DPI&F colleagues and staff too numerous to list here.

CONTENTS

1. BACKGROUND

This project addressed the need to demonstrate, in a commercial context and with close producer participation, how the judicious management of fire and stocking pressure can together lead to improvements in the composition and productivity of native speargrass lands. As a result, beef producers have an enhanced capacity to make better management decisions, for their own and the community's benefit.

There are six million hectares in Queensland's southern speargrass zone which occupies much of the sub-coastal, and some coastal areas, from about Rockhampton in the north to the New South Wales border with Queensland. It was recognised that an estimated two million hectares are under an increasing threat of lower production and susceptibility to erosion because of a predominance of undesirable pasture species, mainly wiregrass (*Aristida* spp.). The amount of wiregrass in these pastures, particularly in sub coastal areas, has increased since the 1970s. The problem has been exacerbated by the associated effects of heavy grazing and many years of below-average rainfall. As wiregrass incidence increases, the effective grazing pressure on the rest of the pasture increases, leading to lower production and increased risk of erosion.

Many producers recognise that regular, often annual, burning of native pastures helps maintain desirable pasture composition. Despite this, the increasing incidence of wiregrass had not been arrested on a broad scale. A belief that higher stocking rates lead to higher economic returns and other pressures have precluded producers from adopting sufficiently light stocking rates. Also, many producers need convincing that reducing stocking rate not only improves pasture composition but does so at little or no cost to overall cattle production.

This project was developed as the sequel to detailed controlled experiments at Brian Pastures Research Station, in which a host of burning and grazing combinations were evaluated (see Orr and Paton 1993a). These experiments provided dramatic evidence that particular burning and grazing strategies can depress wiregrass and increase speargrass. The special value of this work was that it showed the extent and rate of change in botanical composition, and the processes leading to that change.

The next step was to apply this work on a commercial scale covering a range of circumstances (eg. soil type, stocking rate, extent of degradation). This report outlines how this was done, the results and the flow-on to industry.

2. PROJECT OBJECTIVES

(a) By the year 2001, develop cost efficient whole property management principles that will enable individual landholders to transform wiregrass infested pastures into productive speargrass pastures.

(b) To demonstrate those management principles and encourage their adoption through a planned communication strategy.

(c) By the year 2001 have producers in the Burnett armed with the knowledge of these management principles and how to apply them as part of their whole property management.

(d) To enhance producers' whole property management skills in regard to native pastures and cattle production.

The project was extended to June 2003.

3. METHODOLOGY

Best-bet burning and grazing treatments were demonstrated on four commercial paddocks in the southern speargrass zone. Co-operators offered use of their properties at Monto ("Glencoe"), Mundubbera ("Derarby"), Proston ("Corrunovan") and Esk ("Stanley House") (Table 1).

The co-operators were each asked to assemble a group of local producers to contribute to the planning and implementation of the project at each site. These groups were involved from the time of the first discussions about the projects. Members of these "core groups" are listed in Table 1. They were subsequently invited to all site visits, whether to discuss plans, weigh cattle, sample pastures or attend field days involving a larger number of producers.

Table 1: Details of sites, associated groups of producers, and third treatment at each site

Property name and address	**Co-operators**	**Core producers**	**Third treatment**	**Cattle allocated and grazing commenced**
"Corrunovan" Boondooma MS 660 Proston 4613	Grimes family	R J & B Heading R L & J J Creagh S L Laidler G L & J A Jerrard C A Seiler J E Thomson R Somerset P Fletcher S Walsh B. Brown W. Edwards T & J Scanlan R & J Taylor R & A Greenup H Campbell J McLaughlin	Burn in spring, normal property stocking rate, destock between Christmas & when speargrass seeds (about April/May)	November 1993

Property name and address	Co-operators	Core producers	Third treatment	Cattle allocated and grazing commenced
"Derarby" Deri Dera via Mundubbera 4624	Ross & Joan Elliott	J Slack A Bambling D Ryan M Allen D Ericson M Benham B Harzer J Zillman J Webb G Jenkinson J Vicary A Vicary A & F McBurnie D Bell A Robinson T Briggs G Webb R & M Berthelson C & D Crouch T Allen R Read J & L Lindenmayer	Burn in spring, destock for 2 months and until speargrass is 10cm tall then restock until SG begins to set seed and destock until seeding is finished.	September 1993
"Glencoe" Tandora via Monto 4630	Pat & Janelle Connolly	J Sinclair A & G Sloss I Gitsham D White K Hutson C Hartwig M Hamilton L, P & B Ahern B & V Hutchinson J & M McGuigan M, M & M Boothby C & J McIntyre J & J Henderson J & L Hartwig R Simmons P & J Pownall J Moisson P Williams J & L Lindenmayer	Burn in spring, take cattle out for 3 months or until speargrass is 15cm tall	December 1993
"Stanley House" Somerset via Esk 4312	Vince, Joan & Charles Burke	R McConnel J McConnel J Copley T Copley J Westaway	Burn in spring, reduce stocking rate to half between Christmas & about May when speargrass seeds	September 1993

Each site was subdivided into three paddocks. One was an unburnt control, with the same grazing management currently used at that site. The second was burnt annually and grazed at half the stocking rate. The third was burnt and grazed at strategically-adjusted stocking rates. The core group of producers associated with each site decided the details of the third

treatment (Table 1). For the burning treatments the intention was to burn annually, in September/October and after 25mm of rain. Drought conditions precluded burning in some years and influenced the effectiveness of the burn in others.

Grazing commenced late in 1993 (Table 1). The types of cattle and paddock sizes at each site are given in Table 2. Drafts of cattle were replaced about every year. Cattle were weighed at least twice a year. At Glencoe, cattle performance was assessed in terms of weaner weight at time of weaning and weaning rates. Those figures therefore give only a rough indication of cattle performance, considering the interacting effects of many factors, such as lactation and pregnancy status of each breeder in the previous year, breeder age, etc.

Table 2: Type of cattle and paddock sizes at each site

Site	Type of cattle	Paddock	Size (ha)	No of cattle
Corrunovan	weaners	Control	106	27
		Half SR	154	19
		Tactical	82	21
		Total	**342**	**67**
Derarby	weaners	Control	34	21
		Half SR	83	26
		Tactical	44	27
		Total	**161**	**74**
Glencoe	breeders	Control	284	54
		Half SR	310	30
		Tactical	135	25
		Total	**729**	**109**
Stanley House	weaners and yearlings	Control	160	83
		Half SR	78	22
		Tactical	120	62
		Total	**358**	**167**

The “Stanley House” site was sold in January 1995 and was no longer available to the project.

Some changes in stocking rates occurred as the demonstrations progressed. At Derarby, the stocking rate of the half stocked treatment reverted to three quarters stocking rate from 1996/97 through to 1998/99. At Corrunovan, the half stocked treatment became fully stocked and burnt annually from 1997/98.

Pastures were sampled (Botanal method) in September-November 1993, April-May 1994, January 1995, March-April 1995, September 1995, May 1996, January 1997, June 1997, September 1997, May 1998, May 1999, May 2000 and June 2001. Data were collected on total yield, yield of species, species frequencies and speargrass seedling density (the latter only in January 1995 and January 1997).

3.1 Evaluation

To ensure the Project was on track to achieving its objectives an internal evaluation was conducted that addressed 5 key areas:

(a) What are producers’ current management practices?

(b) What is the extent of the wiregrass problem?

(c) How well is the project team implementing its extension process?

(d) How are producers utilising the knowledge developed by SWAMP in their speargrass country management practices?

(e) How does this project improve producers' production and sustainability?

A new member of the SWAMP Team was given the task of evaluation to avoid bias from others more familiar with the project. Our evaluation objectives were set and the key questions above constructed to address those objectives. A producer survey was then compiled with questions that would answer the first 4 of the key questions.

3.2 Economics

The increase in growing cattle weight gains (see Results section), due to a combination of reduced stocking rates and burning, proved more economical in drier years, particularly where normal property stocking rates were high, eg. 1.6 ha/weaner at Derarby. Even at Glencoe, where breeder cattle were used in the demonstration, average calving percentages and weaning weights were greater in the half stocked paddocks in the first three years. These figures were encouraging, and not always evident in other studies, but were based on a paddock to paddock comparison.

In an endeavour to answer producers' questions, data generated from the SWAMP project was used to determine the economic effects of reducing stocking rate and burning on a typical beef property herd.

To run the simulations, input data were taken from the Derarby growing cattle and the Glencoe breeding cattle. Weight gains of growing cattle from Derarby for the Control and half stocked paddocks were averaged for each treatment for the years 1993 to 1996. Similarly, weaner weights and weaning rates from Glencoe were averaged for these years. Simulations were made using the herd model BREEDCOW.

3.3 Producer case study interviews

Several of the participating producers were chosen for interviewing with the view of providing case study articles for media release. The objective was to draw out the main management principles they had constructed from their experience and the project, show how they used these in management of their own operations and to find out why they thought the project was effective. These interviews were then used as media articles for local and State press and the regional newsletter, Beeftalk.

An independent operator was chosen to do the case studies and the interviews were constructed along the following lines, asking about:

- general property management, markets, goals;
- cattle management strategies:

- breeds
- supplements
- paddock/group (eg. steer, breeder) management (eg. steers on scrub, etc)
- areas each group run on by country type

- pasture management strategies
  - spelling and how (eg. rotaional)
  - burning
  - sown pastures?

- SWAMP
  - appeared successful. Did they think it successful? - why or why not?
  - what was it about SWAMP that appealed to them?
  - how could similar things be improved?

Interviews were conducted with the following participants:

- Ross & Joan Elliott
- Des & Edith Ryan
- Bruce & Vivian Hutchinson
- Grimes family
- Seiler family.

4. RESULTS AND DISCUSSION

4.1 Rainfall

Annual rainfall varied considerably for all the sites during the project (Table 3).

Table 3: Annual rainfall at the various sites

Site	Annual Rainfall (mm)								
	1993	1994	1995	1996	1997	1998	1999	2000	Long-Term Average
Corrunovan	478	488	759	916	679	927	768	318	650
Derarby	488	351	862	708	635	933	449		700
Glencoe	325	331	599	579	496	915	561		675
Stanley House	544	477	429*						875

* January to May inclusive

4.2 Pastures

4.2.1 Overall details

Complete details of total pasture yield, the proportions of yield and actual yields and frequencies of occurrence for 8-10 main species at each site at each sampling are given in Appendix 1. The main effects of treatments are described in the following.

4.2.2 September-November 1993

At the start of the project in Spring 1993, pasture yields in most paddocks at each site were similar (Table 4). Wiregrass was a substantial component of pasture yield at all sites, especially at Glencoe where it comprised up to 70% of the total yield and was present at up to 85% of the spots sampled in the paddock. Despite the considerable presence of wiregrass at Corrunovan, Derarby and Stanley House, these sites also had at least reasonable proportions and frequencies of speargrass and bluegrass. In contrast, Glencoe had little speargrass at this time.

Table 4: Pasture yields, composition and frequency of main pasture species at each site in Spring 1993

Site	Paddock	Yield (kg/ha)	Proportion of yield (%)					Frequency of occurrence (%)				
			SG*	WG	FB	PB	CG	SG	WG	FB	PB	CG
Corrunovan	Control	2045	23	22	0	6	25	66	45	0	15	20
	Half SR	2335	19	10	0	8	22	78	39	0	21	39
	Tactical	2390	17	15	0	11	34	62	36	1	26	36
Derarby	Control	2175	36	10	26	10		71	19	45	20	
	Half SR	2220	20	26	24	8		49	29	44	17	
	Tactical	2075	28	5	46	7		63	13	65	15	
Glencoe	Control	2950	1	71	0	9		8	85	2	40	
	Half SR	2890	4	62	1	7		14	75	5	22	
	Tactical	2665	2	60	1	11		10	81	2	38	
Stanley House	Control	2165	12	43	9	15		53	57	28	55	
	Half SR	2135	22	35	9	19		68	57	35	61	
	Tactical	1610	8	40	3	19		30	47	15	55	

*SG=speargrass; WG=wiregrass; FB=forest bluegrass; PB=pitted bluegrass; CG=canegrass

4.2.3 April-May 1994

Pasture yields in Autumn 1994 were reasonable at all sites except Glencoe (Table 5), where continued drought and poor composition depressed yields. Across all sites the half stocking rate paddocks yielded most heavily. Pasture data from this sampling period are more representative of composition as pastures have expressed their full potential at this time of year and, therefore, these results will be used for main comparisons with other data later in the Results section.

Table 5: Pasture yields, composition and frequency of main pasture species at each site in Autumn 1994

Site	Paddock	Yield (kg/ha)	Proportion of yield (%)					Frequency of occurrence (%)				
			SG*	WG	FB	PB	CG	SG	WG	FB	PB	CG
Corrunovan	Control	1720	47	8	1	5	25	87	36	2	17	36
	Half SR	2565	61	6	2	3	18	85	38	1	16	38
	Tactical	2315	46	9	0	9	26	83	42	1	19	42
Derarby	Control	1745	33	25	22	9		66	33	34	32	
	Half SR	2715	25	24	24	6		47	41	35	24	
	Tactical	2105	37	9	37	6		68	36	50	30	
Glencoe	Control	1605	9	62	1	12		20	74	3	32	
	Half SR	1935	3	67	1	15		9	82	3	49	
	Tactical	1445	3	57	1	17		11	79	1	44	
Stanley House	Control	2490	23	31	1	22		54	42	5	71	
	Half SR	2955	40	21	4	19		78	41	12	63	
	Tactical	2160	21	26	2	28		40	36	5	72	

*SG=speargrass; WG=wiregrass; FB=forest bluegrass; PB=pitted bluegrass; CG=canegrass

The proportion and yield of speargrass in pastures generally increased from Spring 1993 to Autumn 1994. For example, at Corrunovan the proportion of speargrass increased from about 20% of total yield to as much as 60% in the half stocking rate paddocks. At Stanley House the comparable change was from about 20% up to 40%. Even though there was an increase in the proportion and yield of speargrass there was no particular increase in the number of speargrass plants as measured by frequency of occurrence. However, at this time it was observed that the half stocking rate paddocks were setting more speargrass seed, which had an impact in the following summer on the number of plants and hence the frequency of occurrence (see later).

In Autumn 1994, wiregrass still comprised a high proportion of yield in most pastures, especially at Glencoe. Another unpalatable coarse grass is canegrass (*Arundinella nepalensis*) which was more of a problem than wiregrass at Corrunovan, comprising 20 to 30% of total pasture yield (see Appendix 1). Canegrass is a widespread grass weed which is particularly prevalent in areas of the South Burnett. Pitted bluegrass (*Bothriochloa decipiens*), a less desirable grass than either speargrass or forest bluegrass (*Bothriochloa bladhii*) and unpalatable like wiregrass or canegrass, was significant at Stanley House.

4.2.4 January 1995

The continuing drought was reflected in low pasture yields in January 1995 (Table 6). Yields were less than 1000 kg/ha in all paddocks except the half stocking rate paddocks at Glencoe and Stanley House, at a time of the year when double those yields would be expected.

Table 6: Pasture yields and speargrass seedling density at each site in January 1995

Site	Paddock	Yield (kg/ha)	Speargrass seedlings per m^2
Corrunovan	Control	645	0.2
	Half SR	360	18.5
	Tactical	215	19.0
Derarby	Control	390	1.5
	Half SR	296	6.9
	Tactical	375	8.5
Glencoe	Control	860	0
	Half SR	1060	0
	Tactical	810	0
Stanley House	Control	815	0
	Half SR	1535	0
	Tactical	720	0

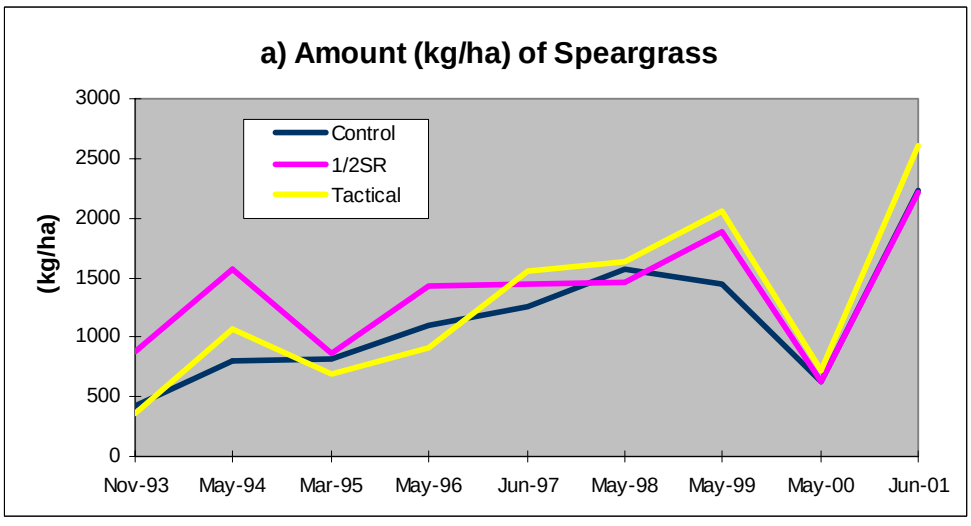
Those paddocks at Corrunovan and Derarby which had been burnt in the previous Spring (ie. other than the control paddocks) had far greater numbers of speargrass seedlings present in January 1995 (Table 6).

Pasture data for the remainder of the demonstrations will be illustrated graphically for each site to gain a better overall picture.

4.2.5 Corrunovan

Yields of black speargrass increased at Corrunovan during the period of the demonstration (Figure 1a). The half stocking rate and tactical paddocks tended to have the most speargrass. However, the amounts of canegrass and wiregrass continued to increase in the unburnt control to the extent that there was more than 3 times the amount in the control than in either of the burnt paddocks (Figure 1b) by June 2001.

Figure 1: Amounts of a) Speargrass and b) Wiregrass plus Canegrass at Corrunovan



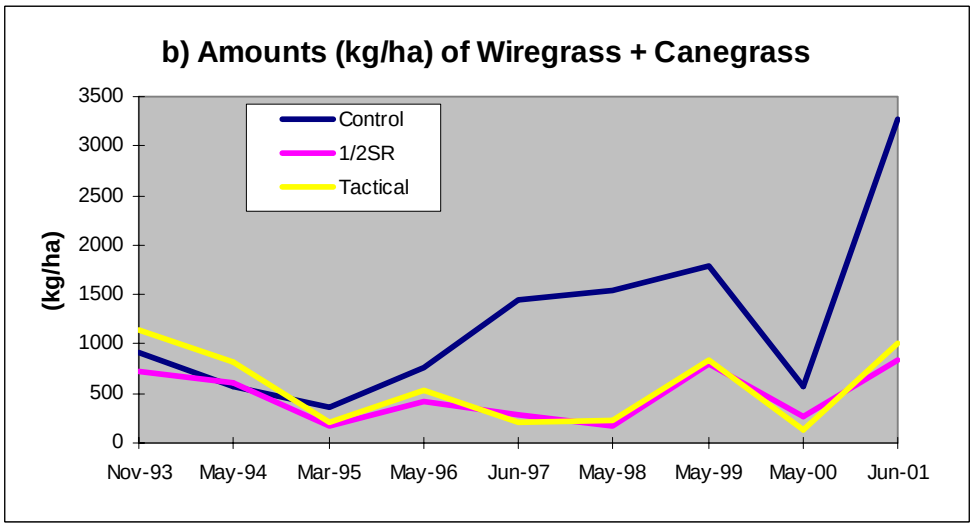
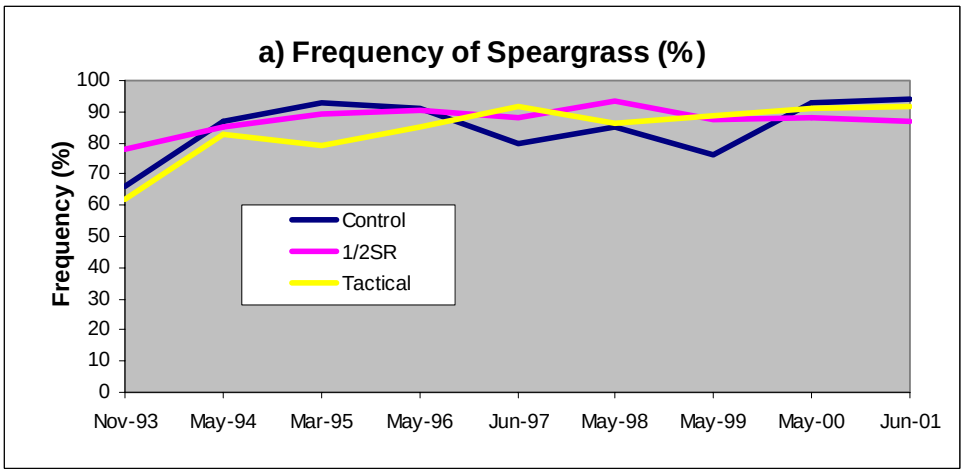
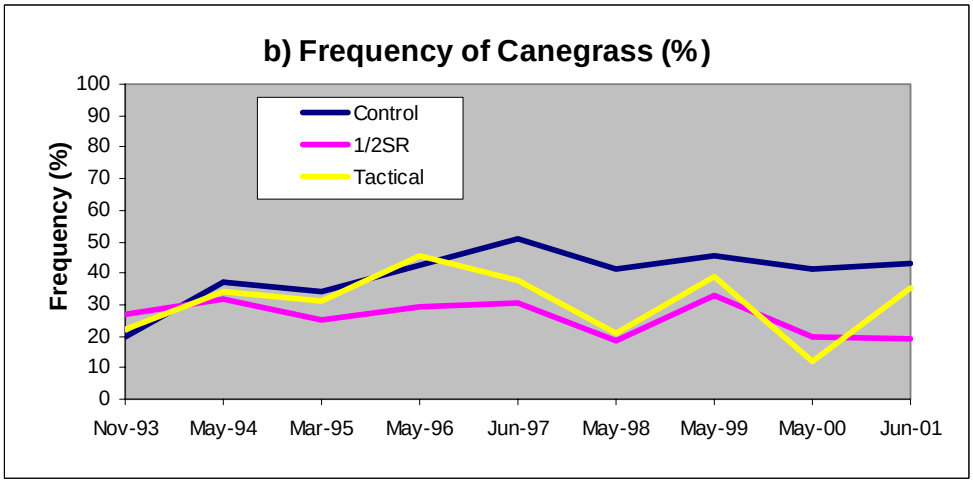


Figure 2: Frequencies of a) Speargrass and b) Canegrass at Corrunovan



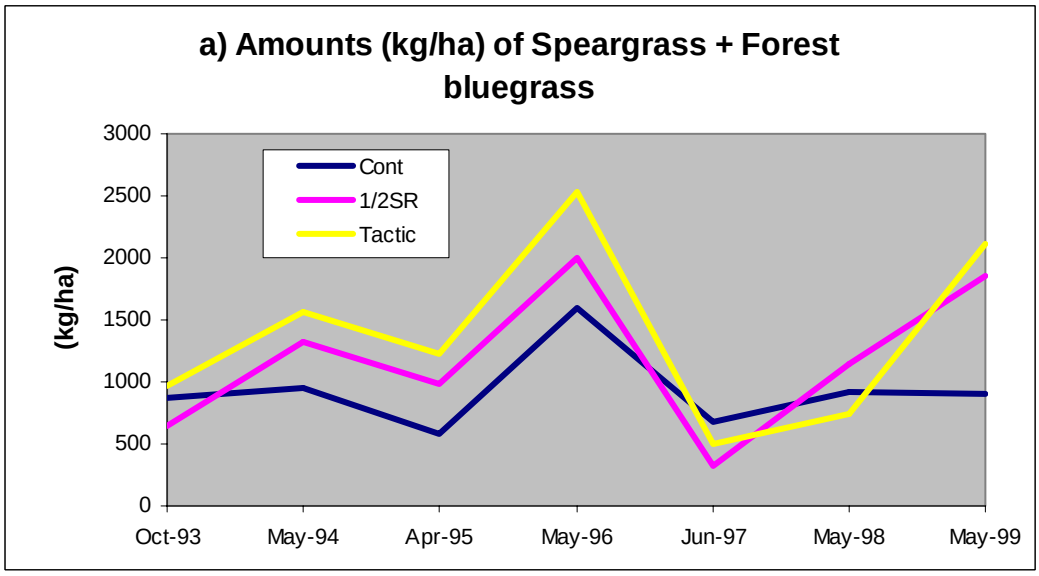


The abundance (frequency) of speargrass was high in all paddocks, irrespective of burning, throughout the demonstration (Figure 2a). However, the frequency of canegrass increased in the unburnt paddock from 20% in 1993 to 43% in 2001.

4.2.6 Derarby

Pasture composition at Derarby remained slightly better in burnt paddocks at Derarby. Amounts of speargrass and forest bluegrass were consistently higher in these paddocks than in the unburnt control (Figure 3a).

Figure 3: Amounts of a) Speargrass plus Forest bluegrass and b) Wiregrass plus Pitted bluegrass at Derarby



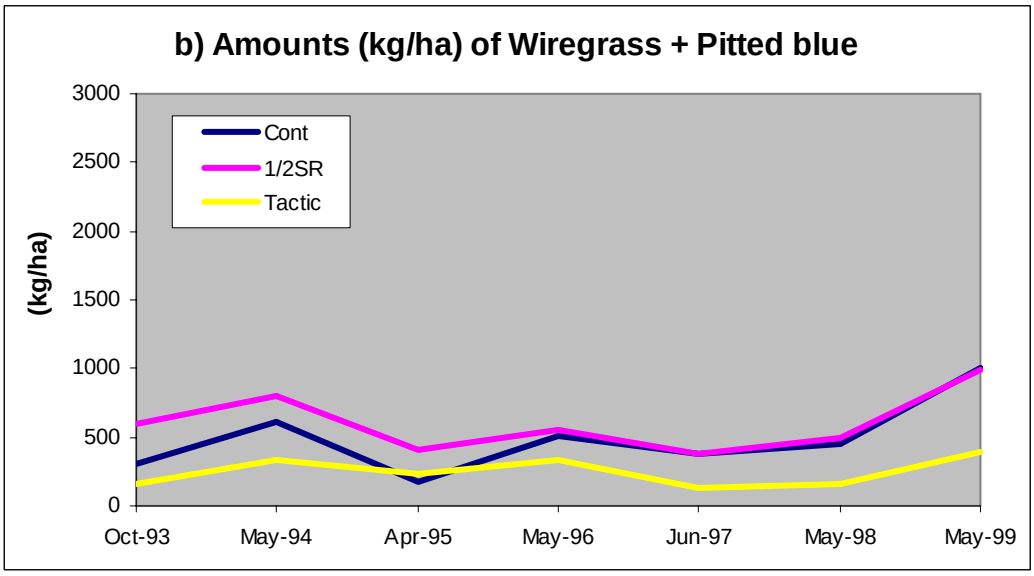
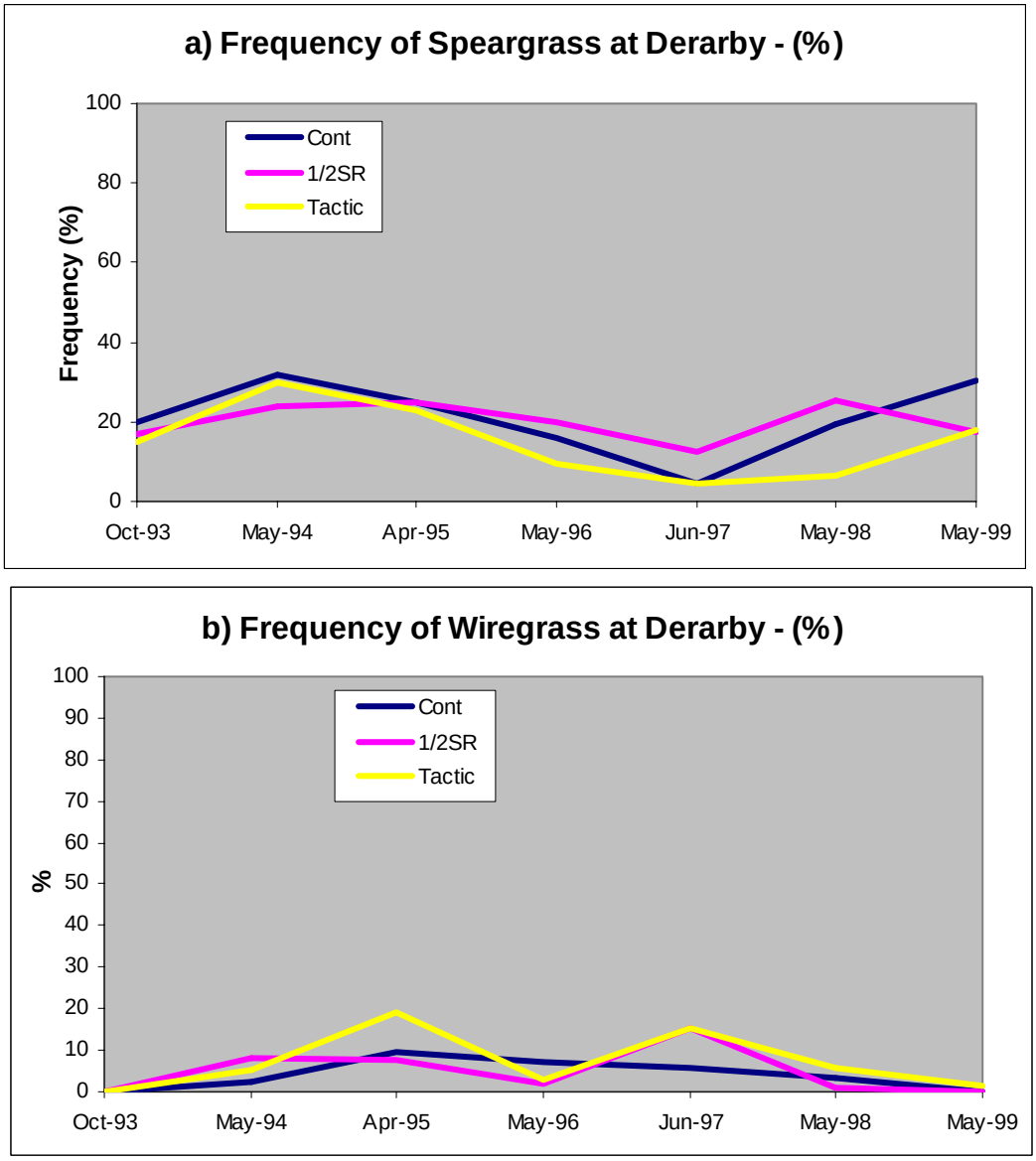


Figure 4: Frequencies of a) Speargrass and b) Wiregrass at Derarby

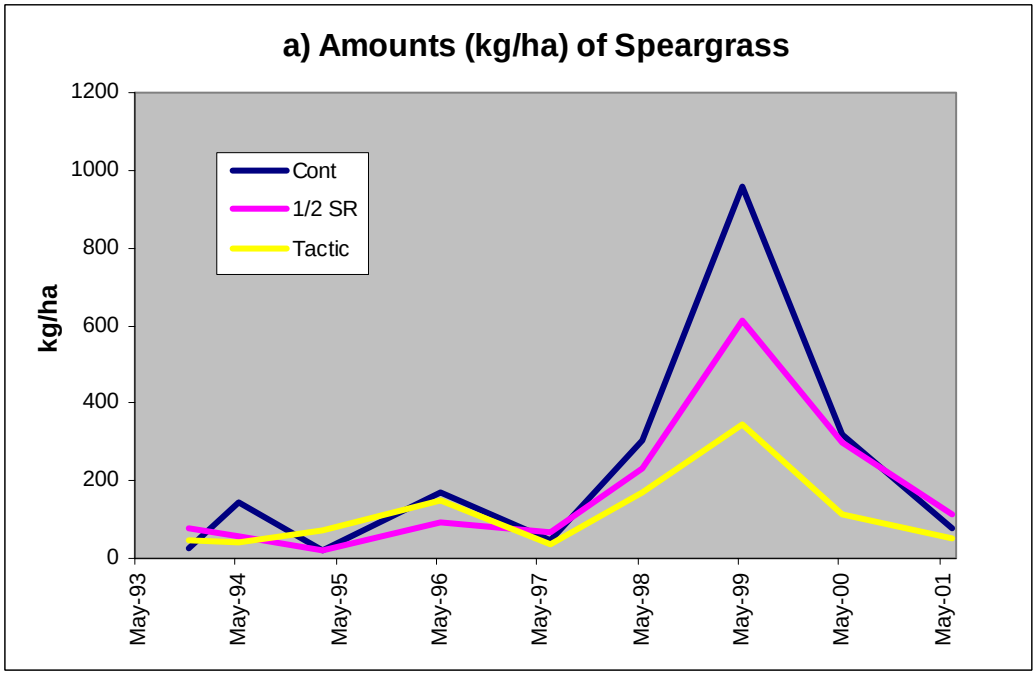


Frequencies of speargrass were similar in all paddocks (Figure 3a) and frequency of wiregrass was minimal in all paddocks (Figure 3b).

4.2.7 Glencoe

Amounts of speargrass gradually increased in the burnt paddock stocked at half commercial rates (Figure5). The amounts of wiregrass were higher in the half stocked paddock early in the demonstration but were comparable with the control by May 2001. It is likely that the plunge in the amount of wiregrass in the control paddock was due to cattle grazing the wiregrass during the severe drought when no other feed was available. A similar pattern was observed in other paddocks but not as dramatic.

Figure 5: Amounts of a) speargrass and b) wiregrass at Glencoe



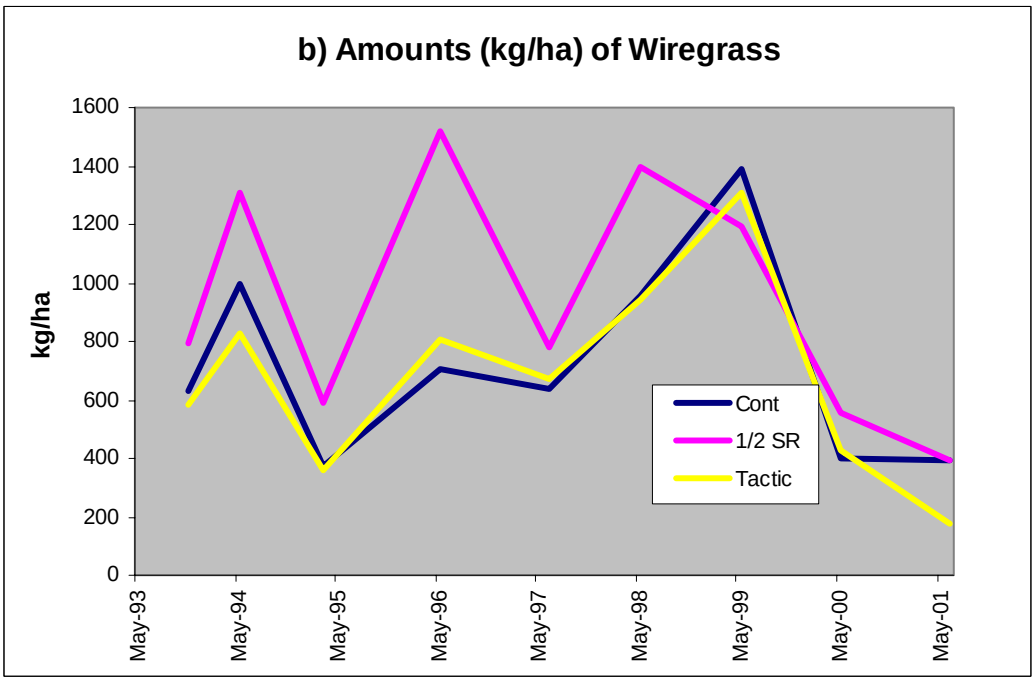
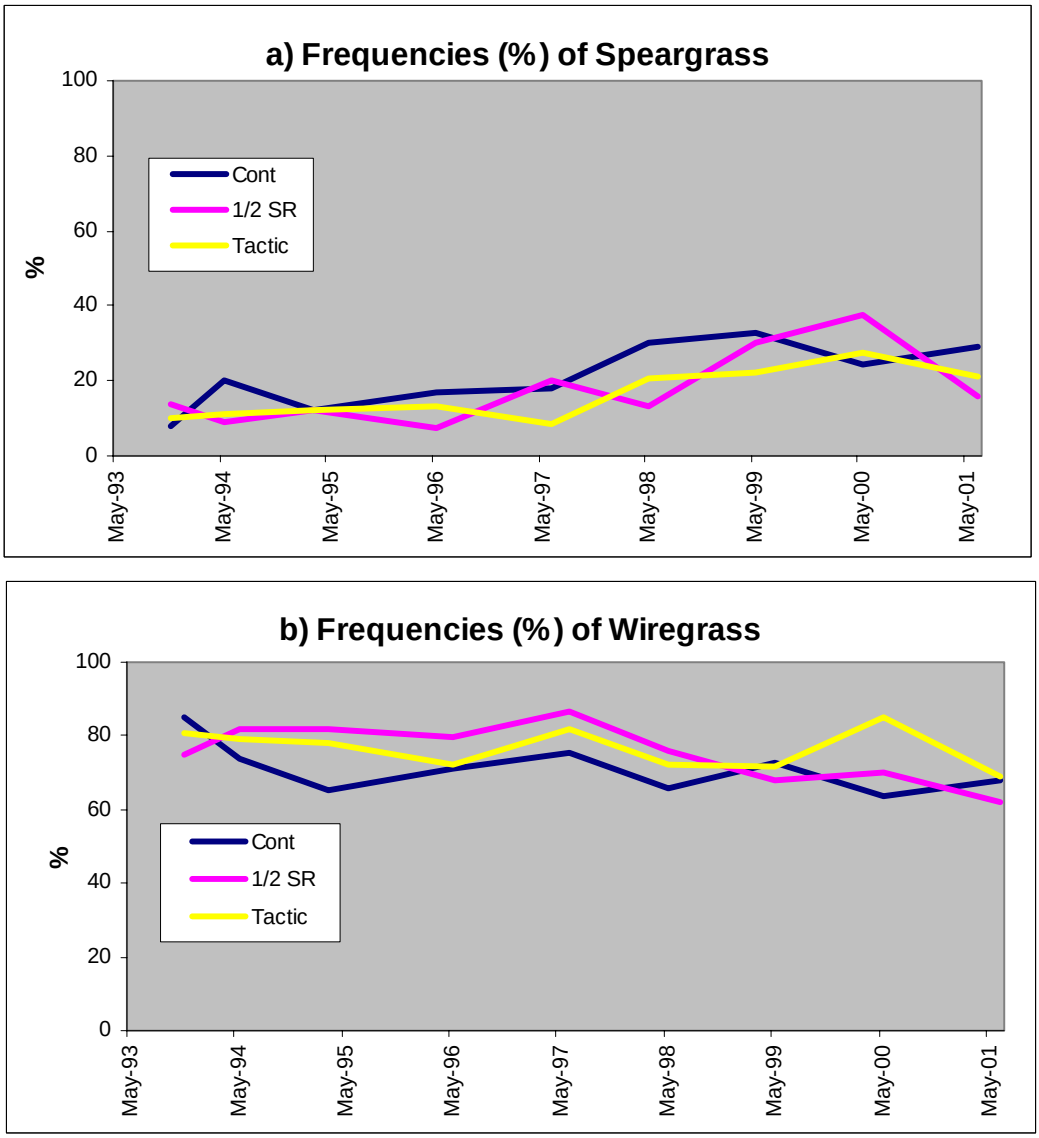


Figure 6: Frequencies of a) speargrass and b) wiregrass at Glencoe



The frequency of occurrence of speargrass was low (9%) in the half stocked paddock in May 1994 compared with 20% in the control at the same time (Figure 6). Speargrass frequency gradually increased in the half stocking rate paddock until it reached a peak of 38% in 2000 compared with a frequency of 24% in the control at the same time. This trend reflected what could be seen in the paddocks from overall observations but a subsequent decline in the frequency and amount of speargrass in the half stocked paddock for 2001 was inconsistent with observations. A reduced number of operators collecting pasture data, and thus, a reduced number of transects sampled in 2001 may have affected the outcomes.

The frequency of wiregrass declined with time in the half stocked paddock from 82% in May 1994 to 62% in June 2001.

These pastures are estimated to have been in C condition (using the ABCD Framework from the Grazing Land Management Workshop, EDGE*network*) at the beginning of the demonstration. Despite some improvement they would still have been in C, or upper C condition at the conclusion of the demonstration, showing how slow pastures can be to recover when condition is initially poor.

4.3 Cattle production

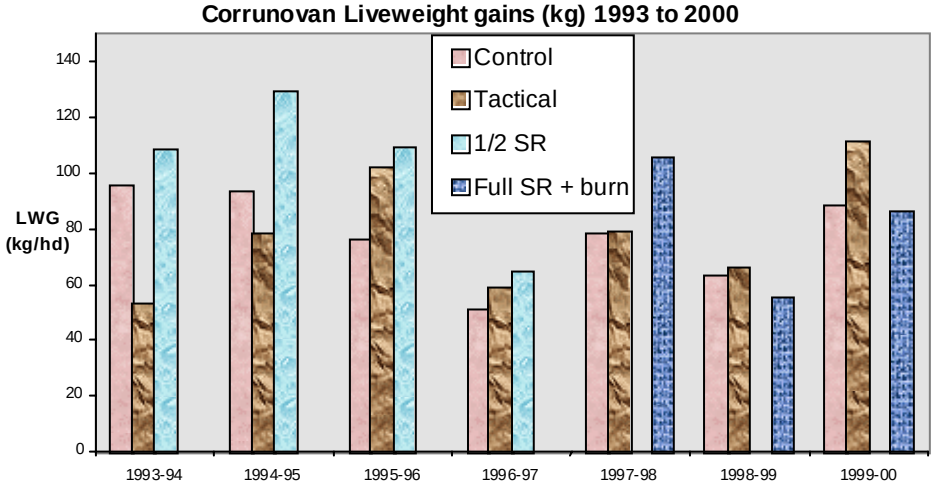
4.3.1 General outcomes

- Cattle growth rates were greatest in the lightly stocked paddocks at each of the sites.
- Growth rates of cattle responded most to reducing stocking rate at Derarby where stocking rate of the control was relatively high (1.6 ha/weaner).
- Growth rates of cattle at Corrunovan were not so different between treatments. The commercial stocking rate of 2.5 ha/weaner was sufficiently light to preclude a large response to halving stocking rate.

4.3.2 Corrunovan

The cattle liveweight gains varied considerably according to season. They ranged from as little as 50 kg/head in the unburnt control for the year 1996/97 to 130 kg/head in the half stocking rate paddock for the 1994/95 year (Figure 7). Cattle weight gains were consistently highest in the paddock that was burnt and stocked at half the rate of the control. Weight gains for the tactically stocked paddock varied relative to the other paddocks according to how long they were left out of the paddock to spell pastures; weight gains were not recorded when the cattle were out of this paddock. Any advantage in weight gains in the half stocked paddock was lost once that paddock was returned to full stocking.

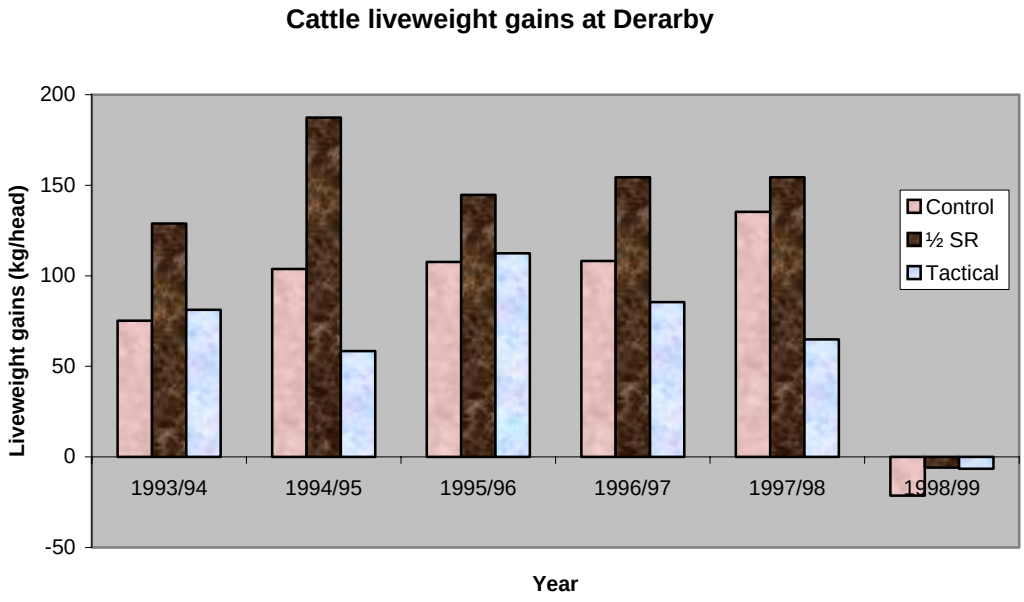
Figure 7: Annual weight gains of cattle at Corrunovan



4.3.3 Derarby

Liveweight gains of cattle at Derarby were consistently higher in the half stocking rate paddock (Figure 8). Cattle in this paddock sometimes gained almost twice the weight of cattle in the more heavily stocked control. The particularly dry summer of 1998/99 resulted in cattle losing weight between the initial weighing in September and the final weighing in June.

Figure 8: Annual weight gains of cattle at Derarby



4.3.4 Glencoe

Weights of weaner calves were consistently higher in the burnt paddock stocked at half the rate of the control (Table 7). Also, weaning rates were 11% higher on average for the first 3 years, 1993 to 1996, than in the more heavily stocked control. Weaning percentages became more erratic in other years due to the management policy of the property where empty breeders were replaced with pregnant cows.

Table 7: Average Calving Percentages and Weaner weights

Paddock	Stocking Rate (ha per breeder unit)	1993 to 1996		1997/98		1999/2000	
		Calving %	Weaner wt (kg)	Calving %	Weaner wt (kg)	Calving %	Weaner wt (kg)
Control	5.3	65	207	87	220	91	218
Half SR	10.3	76	215	80	270	86	260
Tactical	5.4	71	206	100	240	77	225

4.4 Project evaluation

Of the 41 producers involved in the project at the time of the survey, 22 responded. The total property areas of the respondents was 135 000 ha on which 17 800 head of cattle are run.

Twelve of the respondents indicated that wiregrass or similar unpalatable grasses were a problem on their properties which represented an area of 61 000 ha.

One of the survey questions was “What do you think SWAMP is trying to achieve?” and these are some of the responses:

- “Identify grazing/burning management strategies to manipulate pasture composition; explore the economics and environmental sustainability of these; educate producers”.
- “Better use of native pastures; species recognition better managers of forest country”.
- “Educate people to manage speargrass country to achieve maximum productivity and profitability results”.
- “Rejuvenate wiregrass or rundown pasture and still maintain an income from the country”.
- “Sustainable beef yields off sustainable quality native pasture”.

Other outcomes of the survey indicated that SWAMP participants:

- have good pasture identification skills;
- have a good understanding of the role of different pasture species (speargrass and wiregrass);
- have a sound knowledge of management options required to change pasture composition and the effects of those options on individual pasture species (speargrass and wiregrass);
- use practices such as burning and pasture spelling;
- monitor ground cover, pasture yield and composition;
- adjust stocking pressure at times;
- are informed of SWAMP activities and have opportunities to be involved;
- feel the SWAMP information is relevant and useful;
- are more aware of management issues;
- have a better understanding of how stocking pressure and fire impact pastures;
- are confident in their ability to interpret changes in their pasture systems.

Overall there was a strong indication that the project had achieved its contract objectives.

As a result of these outcomes project team members and participating group members discussed changing the objectives and focus of the project to broaden its application.

Discussions with producer group members identified a number of issues that they wished to address.

- Expand the membership of the group.
- Address broader pasture and cattle management issues in a whole property context.
- Extend the project for at least one year.
- Investigate and discuss pasture management problems on members' properties with a view to determining management options to overcome any problems.

As issues were identified at each of these property sites the groups collaborated with the relevant NAP3 Project or agency, eg. Producer Monitoring Project, Futureprofit module, Resource Consulting Services Grazing For Profit graduate group, Landcare group, etc., that could address the issue. A field day, discussion day or research site visit was then organised with that project or group.

4.5 Economic analyses of data

In the first and second simulations (Table 8, columns headed "Normal" and "Half Breeders") a comparison was made between the herd from a heavily stocked property with degraded pastures, running 300 breeders and producing stores, and the same property, but with half the number of breeders, and producing stores. This option of halving breeder numbers and producing stores reduced gross margins by 22%. Note that total adult equivalents of the Half Breeder option is more than half the normal scenario due to heavier growing cattle and higher weaning rates.

Because the growing cattle on the Half Breeders option are gaining more weight the property owner may now have an option of growing cattle out to Jap-Ox and this option is considered in the "Finish" column. In this example total adult equivalents is maintained at 370 by manipulating breeder numbers accordingly. This option returned gross margins little different to the normal stocking option but would enable a property owner to maintain pastures and cattle in good condition with little or no land degradation and a minimum of cattle supplementation required.

The "Half Breeders" and "Finish" options were considered for pastures recovering from poor composition where they were originally dominated by wiregrass. The "Finish, good pastures" option considers the herd dynamics and gross margins of a property once pasture composition is recovered and better species such as black speargrass and forest bluegrass dominate. In this situation the breeder numbers are half that of the normal scenario but adult equivalents are about 75% of normal compared with 63% of normal in the Finish situation. We made the assumption that better pasture composition will allow a slight increase in carrying capacity. This option lifted gross margins by 13% on the normal situation.

Table 8: SWAMP Economics

	Normal	Half Breeders	Finish	Finish Good Pastures *
Adult Equivalents	585	370	370	435
Total Cattle	700	381	370	435
No. Breeders	300	150	127	150
Weaning Rate	65%	76%	76%	76%
Steers Sold	30 mths	30 mths	42 mths	42 mths
Steer Sale Weight (Price)				
6 months ($1.10)	207 ($207)	215 ($215)	215 ($215)	215 ($215)
18 months ($1.00)	303 ($278)	369 ($341)	369 ($341)	369 ($341)
30 months ($0.95)	400 ($350)	523 ($431)	523 ($431)	523 ($431)
42 months ($2.00)			352 dw ($689)	352 dw ($689)
Female Sale Weights (Price)				
6 months ($0.80)	207 ($148)	215 ($154)	215 ($154)	215 ($154)
18 months ($0.75)	303 ($206)	369 ($353)	369 ($353)	369 ($353)
30 months ($0.70)	400 ($255)	450 ($288)	450 ($288)	450 ($288)
3 Years + ($0.70)	440 ($281)	490 ($314)	490 ($314)	490 ($314)
No. Steers Sold	95	55	45	54
No. Females Sold	92	53	46	53
Net Sales	$58 482	$39 734	$45 416	$53 395
Capital Value of Herd	$181 643	$109 258	$112 821	$132 641
Int. on Capital Value of Herd (5%)	$9 082	$5 463	$5 641	$6 632
Gross Margin for Herd	$43 250	$32 034	$38 505	$45 270
Gross Margin after Interest	**$34 168**	**$26 571**	**$32 864**	**$38 638**

* This example is after pastures are recovered and maintaining half the breeder numbers but total adult equivalents will be higher than in the recovery period.

4.6 Producer involvement

A noteworthy aspect of this project has been the high degree of producer involvement. Apart from the co-operating producers themselves, the group of producers attached to each site has had a considerable involvement in the project. These groups have no formal arrangements or title, known colloquially as the “six packs”.

The involvement and interest of the people in these groups may be attributed to the fact that they made the decision on the third treatment at the beginning of the project. Since then they became more and more involved. An example of this interest is the fact that several producers played an active role in pasture sampling at the Corrunovan site, while others at Glencoe set up and helped to sample a Grass Check site annually.

The obvious benefits from close producer involvement include an enhanced capacity of these producers to make better decisions about burning and stocking rates on their properties.

4.7 Producer case study interviews

The full interviews can be seen in Appendix 3. Some comments include:

- “The canegrass was hugely diminished by burning; but for the SWAMP trial we definitely wouldn’t have been that scientific in terms of observation.” Mr Seiler said the SWAMP trial focused him on levels and quality of available pasture. He said

the success of SWAMP was largely due to the group of producers who were 'looking to learn' and receptive to DPI&F messages." (Col Seiler).

- "Wiregrass is useless for cattle because there is no leaf on it and once it gets over about three inches high the stock don't touch it because it's just all stalk," he said. "I used to walk around with Col while he was doing the grass sampling and I picked up quite a bit from that; I learnt how to identify the young wiregrass seedlings better." (Ross Elliott).

- Julie Grimes – "…. was involved with the demonstration in several ways: from measuring the amounts and species composition of pastures in their native pasture paddocks to observing pasture growth and cattle weight gains.

  "When I'm riding around the paddock now it's really interesting to see what cover and what sort of grasses are there and to notice what grasses are increasing and what aren't.

  I've become much more attuned to differences in pasture species, pasture yields, and effects of management but we haven't actually changed a lot of the practices on our property because we have always understocked Corrunovan to enable a reasonable body of feed.

  "One of the most beneficial gains of the SWAMP demonstration and group was the interaction between researchers and property owners," Julie said.

  "It was bringing together the results of trials and the ideas of cattle owners. It was putting the research into practice on a larger scale in a real property situation.

  This was important to me as a link between government research and the managers of grass roots primary industry, which I fear in the future will fade into non-existence." Julie said getting the farmers and researchers together was valuable for an exchange of new ideas and practices.

- "We've learnt a fair bit from the trial and I think it was successful because a lot of people have the same problem and were keen to discuss ways to combat it." Bruce said the true value of SWAMP was getting producers together and providing the opportunity to swap information. He said visiting other properties and discussing management options with other graziers had been particularly beneficial, as had using DPI&F officers as sounding boards for ideas and strategies. (Bruce Hutchinson)

- Des Ryan - …. said the project was a good opportunity to learn more about wiregrass control, raise questions on cattle and other pasture management with DPI&F officers, and to discuss local concerns with fellow producers.

  "It was a good project for the country," Des said.

  "Until I got involved in it I didn't really see it (wiregrass) as a problem but it seems to be a problem in country that is overstocked.

"Having smaller paddocks allowed us to rotate stock and this worked in our favour." Des was able to use stocking rate principles seen on the Derarby trial as his soil and vegetation was similar.

5. ACHIEVEMENTS AND INDUSTRY BENEFITS

Some of the achievements accrued from this project have been at the level set out in the specific objectives of the project, while others have been at a more general industry level. At a specific project level the achievements include:

- Four sites selected and established on commercial properties.
- Producers involved in decision-making at each site.
- Wide range of initial compositions.
- Wide range in responses to treatment.
- An increase in speargrass and a reduction in wiregrass in burnt and lightly stocked paddocks.
- Improvements in composition influenced by initial condition of pasture; the better the pasture to start with (or, the least degraded), the quicker the response.
- One site with very little speargrass and considerable wiregrass did not respond until year 6 or 7 of the demonstration.
- Cattle production per head has been greatest on the half stocking rate treatment.
- Cattle production per hectare has been greatest on the control but not always that much more than on the half stocking rate treatment.
- Differences in weight gains have demonstrated the strong influence of seasonal effects and stock and pasture management practices.
- Whole property enterprise economic analyses of results showed that pastures in good condition and stocked lightly can improve gross margins by 13%.
- Apart from the producers involved in the sites as members of the associated producer groups, many producers have visited the sites for field days and the like. For example, 70 producers attended the field day at Corrunovan in May 1995, 50 attended the field day at Glencoe in June 1995 and 30 attended the field day at Derarby in June 1995.

At a specific project level the main outcome for industry has been a realisation or confirmation that pasture burning associated with flexibility in stocking rate may lead to better individual animal production, similar overall production and better pasture composition.

At a general industry level, the achievements include:

- A high degree of producer involvement in project implementation (including planning, data collection, dissemination of information to industry).

- Strong producer involvement has led to opportunities to expose them to other pasture and animal management initiatives, such as woodland management; GrassCheck; Property Management Planning; property development options.

At a general industry level, the main outcome for industry has been a realisation or confirmation for R&D providers, and possibly for producers as well, that producers can be much more involved in project management and decision making.

5.1 Project objectives

The evaluation of the project's effectiveness, through the producer survey, showed that the project had been successful in achieving its objectives. A review of the project, commissioned by MLA, stated that:

"The project has been successful in achieving its objectives and in particular:

- Has enabled producers to make better decisions about their pasture and stock management through the knowledge they have acquired of the principles involved.

- Has shown that restoration of degraded speargrass pasture to a sustainable speargrass pasture is practically feasible on commercial properties, and quantified the cost and time to do so.

- Has demonstrated that producers and researchers/extension staff can form a dynamic partnership when each group has a key role in the conduct of the project at hand."

The review went on to say:

"The model used, of producers involved in a commercial property demonstration trial on an equal footing with DPI&F experts and with DPI&F administrative support, has proven very effective in transferring knowledge about speargrass management. While it is unlikely that a high percentage of producers will want to be involved at this level of intensity, the technology can certainly be spread further if funds are available for additional demonstration trials and producers are keen to participate in them.

The model has been so effective in forming a productive relationship between DPI&F experts and the participating producers that it is worthy of consideration for wider use in dissemination of other technologies."

Refer to Appendix 2 for the full report.

5.2 Impact on the beef industry

A 1996 report to MLA on the economic benefits of maintaining good pasture composition showed that "the beef industry in Queensland's southern speargrass zone could gain an

extra $190 million over the next 25 years if one third of producers with degraded native pastures adopted the findings of the SWAMP project."

The findings were from a research impact assessment study by the Meat Research Corporation of results from the SWAMP demonstration. The study incorporated gross margins of cattle production from wiregrass infested pastures. Gross margins in the region average just over $11 per hectare according to the Australian Bureau of Agricultural Resources and Economics. Figures from the Speargrass, Wiregrass demonstration show gross margins from degraded and wiregrass infested pastures range from $10 to as little as $2.60 per hectare. With burning and lighter stocking to improve cattle and pastures, gross margins were boosted to $10 to $40 per hectare depending on the season and type of country. The benefits of lighter stocking and burning were often a doubling of gross margins, particularly in poorer seasons.

6. RECOMMENDATIONS

- The project has demonstrated how DPI&F extension staff and producers can be highly effective in conducting demonstrations of known management principles.
- The project model could be used to demonstrate other management principles and outcomes of research.
- The information from this project be synthesised into the Grazing Land Management package to demonstrate principles of pasture and cattle management to a wider audience.

7. PUBLICATIONS

1994

- A newsletter for producer members was devised for each of the sites and called the "SWAMP Flyer". Each time cattle were weighed and pastures sampled the newsletter was sent to each of the producer members for that site.

1995

- Articles were written for local and regional papers to publicise the public field days that were held at Glencoe, Corrunovan and Derarby.
- SWAMP Flyers were sent to producer members.

1996

- "Why's that smoke in your eyes?" - article for Central and North Burnett Times, South Burnett Times and Qld Country Life, Sep 96

1997

- "Light stocking, burning strategies can boost productivity". NAP Newsletter Issue 5 Autumn 1997.
- "Pasture strategy productivity key". Beef and Livestock section of Queensland Country Life, July 10, 1997.
- SWAMP Flyers: December 1996, April 1997.

1998

- SWAMP Flyers: December 1997, February, March, May, July, August 1998.
- "Restoring the condition of degraded black speargrass pastures in the southern speargrass zone. DAQ. 091 Milestone Report." Peer Review August 1997.
- Television documentary on Cross Country, August – September 1998

1999

- Paton C., Hansen V-L, Tyler R, Greenup A, Darrow B, Day J, Crosthwaite I and Edwards W (1999) 'Fewer stock can produce better pastures and profits' Proceedings of the VI International Rangeland Congress, Editors David Eldridge and David Freudenberger. P 451.
- SWAMP Flyers: December 1998, February, March, April, September 1999.
- "Restoring the condition of degraded black speargrass pastures in the southern speargrass zone. NAP3.209 Annual Report." Peer Review August 1998 – Awarded Best Presentation of Peer Review.

2000

- SWAMP Flyers: December 1999, April and May 2000.
- "Restoring the condition of degraded black speargrass pastures in the southern speargrass zone. NAP3.209 Annual Report." Peer Review October 1999.

8. REFERENCES

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Orr, DM and Paton CJ (1993a) - Impact of grazing pressure on the plant population dynamics of *Heteropogon contortus* (black speargrass) in subtropical Queensland. Proceedings of the XVII Internation Grassland Congress 1993: 1908 - 1910.

Appendix 1: Pasture data

Pasture data - Corrunovan

Proportion of Yield (%)

Date	Pdk	Yield	Hecon	Bobla	Bodec	Aris	Arnep	Weeds	NLegs	Cyref	Erspp	Trag	Chdiv	Sedge
Nov-93	Cont	1950	22	0	6	22	25	3	1	5	1	0	0	3
	1/2SR	2235	39	0	8	10	22	2	2	2	1	0	0	3
	Tactic	2300	16	0	11	16	34	3	1	5	1	0	0	5
May-94	Cont	1720	47	1	5	8	25	0	0	4	2	0	0	1
	1/2SR	2565	61	2	3	6	18	1	0	2	1	0	0	1
	Tactic	2315	46	0	9	9	26	2	1	2	2	0	0	1
Jan-95	Cont	645	31	2	11	14	30	3	0	2	0	0	0	2
	1/2SR	360	56	0	9	4	14	1	1	1	0	0	0	1
	Tactic	215	59	0	2	2	16	6	0	0	3	0	0	4
Mar-95	Cont	1530	54	0	10	6	17	1	1	3	2	0	0	3
	1/2SR	1325	65	0	6	4	9	2	1	2	3	0	0	3
	Tactic	1380	50	1	14	3	13	3	1	2	3	0	0	4
Sep-95	Cont	1275	37	0	8	7	42	0	0	1	0	0	0	2
	1/2SR	1025	68	0	6	3	12	1	0	1	0	0	0	2
	Tactic	1165	60	1	11	4	13	0	0	2	0	0	0	2
May-96	Cont	2566	43	0	16	4	26	1	0	1	1	0	0	3
	1/2SR	2294	62	0	6	3	15	1	1	2	3	0	0	3
	Tactic	1935	47	0	11	2	25	1	0	0	5	0	0	4
Jan-97	Cont	3727	35	4	11	3	33	2	1	1	0	5	0	2
	1/2SR	1583	52	3	4	3	21	2	1	8	0	0	0	1
	Tactic	1158	64	6	8	1	9	3	2	1	0	0	0	2
Jun-97	Cont	3246	39	1	9	4	40	0	0	2	2	0	1	0
	1/2SR	2043	71	0	5	3	11	1	0	2	2	0	0	1
	Tactic	2146	72	1	7	1	9	1	0	1	4	0	0	0
Sep-97	Cont	2710	22	5	13	6	48	1	0	2	1	0	0	0
	1/2SR	1108	54	20	7	2	11	1	0	0	1	0	0	1
	Tactic	1191	61	16	6	2	12	1	0	0	1	0	0	2
May-98	Cont	3704	42	1	8	5	37	1	1	2	1	0	0	0
	1/2SR	1987	74	0	6	2	7	2	1	1	1	0	0	1
	Tactic	2216	74	0	7	2	8	1	0	1	2	0	0	1
May-99	Cont	4039	36	0	10	7	37	0	0	6	2	0	0	0
	1/2SR	3118	61	0	8	6	20	0	0	2	1	0	0	0
	Tactic	3482	59	0	11	3	22	0	0	4	1	0	0	0
May-00	Cont	1348	47	0	3	5	37	1	0	3	0	0	0	0
	1/2SR	999	62	1	4	9	18	0	0	2	0	0	0	0
	Tactic	965	74	0	4	3	10	2	0	1	1	0	0	1
Jun-01	Cont	6078	37	0	3	13	41	0	0	5	0	0	0	1
	1/2SR	3530	63	1	6	9	15	1	0	2	1	0	0	1
	Tactic	4185	62	0	4	5	19	2	0	2	0	0	0	3

Hecon = black speargrass; Bobla = forest bluegrass; Bodec = pitted bluegrass; Aris = wiregrasses; Arnep = canegrass; Weeds = broad-leaved weeds; Nlegs = native legumes; Cyref = barbed-wire grass; Erspp = lovegrasses; Trag = small burr grass; Chdiv = slender chloris; Sedge = sedges.

Corrunovan **Yield (kg/ha)**

Date	Pdk	Yield	Hecon	Bobla	Bodec	Aris	Arnep	Weeds	NLegs	Cyref	Erspp	Trag	Chdiv	Sedge
Nov-93	Cont	1950	429	0	117	429	488	59	20	98	20	0	0	59
	1/2SR	2235	872	0	179	224	492	45	45	45	22	0	3	67
	Tactic	2300	368	0	253	368	782	69	23	115	23	1	0	115
May-94	Cont	1720	808	17	86	138	430	0	0	69	34	0	1	17
	1/2SR	2565	1565	51	77	154	462	26	0	51	26	0	1	26
	Tactic	2315	1065	0	208	208	602	46	23	46	46	0	14	23
Jan-95	Cont	645	200	13	71	90	194	19	0	13	0	0	0	13
	1/2SR	360	202	0	32	14	50	4	4	4	0	0	0	4
	Tactic	215	127	0	4	4	34	13	0	0	6	0	0	9
Mar-95	Cont	1530	822	1	151	93	264	17	9	40	24	0	0	41
	1/2SR	1325	857	2	73	59	121	28	12	28	34	0	0	38
	Tactic	1380	695	20	197	38	175	38	14	29	41	0	2	51
Sep-95	Cont	1275	475	0	108	93	537	3	0	12	2	1	0	23
	1/2SR	1025	691	0	66	35	123	11	0	7	4	0	2	22
	Tactic	1165	700	0	130	46	153	4	0	28	1	0	0	26
May-96	Cont	2566	1092	0	404	95	669	26	9	19	37	0	4	72
	1/2SR	2294	1430	5	126	63	353	22	25	44	74	0	2	66
	Tactic	1935	910	0	214	46	485	17	7	3	91	0	2	77
Jan-97	Cont	3727	1298	155	402	97	1244	66	19	20	0	185	7	82
	1/2SR	1583	8	51	56	42	340	37	19	120	0	0	0	16
	Tactic	1158	7	68	90	15	106	36	27	13	1	0	0	25
Jun-97	Cont	3246	1253	18	278	141	1303	8	0	55	60	0	16	3
	1/2SR	2043	1443	0	110	52	232	16	2	32	44	2	0	15
	Tactic	2146	1549	25	159	26	191	16	0	16	84	1	0	8
Sep-97	Cont	2710	586	148	356	153	1310	37	0	43	16	0	0	12
	1/2SR	1108	596	21	78	18	120	7	0	5	8	0	0	8
	Tactic	1191	722	192	69	19	141	10	0	1	8	0	0	22
May-98	Cont	3704	1569	25	299	176	1360	34	35	69	20	0	0	14
	1/2SR	1987	1462	5	117	46	130	34	28	29	27	0	0	26
	Tactic	2216	1629	10	157	46	184	15	10	22	54	0	0	27
May-99	Cont	4039	1438	10	394	268	1512	6	6	257	65	0	3	6
	1/2SR	3118	1888	0	257	174	625	15	3	47	40	0	2	14
	Tactic	3482	2053	13	366	88	751	13	0	123	36	0	4	4
May-00	Cont	1348	636	0	45	64	501	15	6	39	2	0	0	4
	1/2SR	999	621	6	42	92	175	5	2	22	4	0	0	2
	Tactic	965	718	0	42	33	101	22	4	8	5	0	0	12
Jun-01	Cont	6078	2223	0	209	802	2476	24	2	91	0	0	0	73
	1/2SR	3530	2221	2	196	309	533	38	2	80	19	0	1	38
	Tactic	4185	2613	0	184	221	795	91	6	61	15	0	0	115

Hecon = black speargrass; Bobla = forest bluegrass; Bodec = pitted bluegrass; Aris = wiregrasses; Arnep = canegrass; Weeds = broad-leaved weeds; Nlegs = native legumes; Cyref = barbed-wire grass; Erspp = lovegrasses; Trag = small burr grass; Chdiv = slender chloris; Sedge = sedges.

Corrunovan **Frequency of Occurrence (%)**

Date	Pdk	Yield	Hecon	Bobla	Bodec	Aris	Arnep	Weeds	NLegs	Cyref	Erspp	Trag	Chdiv	Sedge
Nov-93	Cont	1950	66	0	15	45	20	77	49	11	9	0	0	20
	1/2SR	2235	78	0	21	39	27	74	42	7	8	0	1	27
	Tactic	2300	62	1	26	36	22	83	41	5	15	1	0	22
May-94	Cont	1720	87	2	17	36	37	71	63	14	12	0	2	57
	1/2SR	2565	85	1	16	38	32	64	53	11	21	0	1	35
	Tactic	2315	83	1	19	42	34	69	44	12	30	0	3	45
Jan-95	Cont	645	81	2	26	21	34	15	2	13	4	0	0	21
	1/2SR	360	89	0	9	14	30	16	6	2	5	0	0	23
	Tactic	215	81	0	10	17	25	17	2	0	13	0	0	38
Mar-95	Cont	1530	93	0	24	27	34	64	39	14	17	0	0	62
	1/2SR	1325	89	1	16	30	25	55	41	9	25	0	0	41
	Tactic	1380	79	3	26	24	31	68	30	10	34	0	2	64
Sep-95	Cont	1275	87	0	26	23	52	35	3	3	0	0	0	35
	1/2SR	1025	85	0	12	27	32	37	7	7	5	0	2	49
	Tactic	1165	86	0	17	28	31	31	0	10	3	0	0	38
May-96	Cont	2566	91	0	38	21	43	27	26	7	23	0	3	50
	1/2SR	2294	91	1	17	21	29	39	21	12	28	0	0	38
	Tactic	1935	85	0	22	10	46	38	10	3	37	0	3	71
Jan-97	Cont	3727	76	7	27	13	36	18	0	2	0	2	2	18
	1/2SR	1583	77	4	10	15	21	17	15	19	0	0	0	13
	Tactic	1158	76	15	26	4	7	20	11	4	2	0	0	22
Jun-97	Cont	3246	80	4	31	20	51	78	35	8	57	0	4	27
	1/2SR	2043	88	1	13	19	30	60	29	7	36	2	0	41
	Tactic	2146	92	6	19	10	38	68	22	7	47	1	1	40
Sep-97	Cont	2710	56	23	38	19	42	11	0	6	3	0	0	5
	1/2SR	1108	73	21	19	16	23	9	0	4	6	0	0	11
	Tactic	1191	79	23	25	13	25	11	0	2	10	0	1	19
May-98	Cont	3704	85	2	27	20	41	52	28	16	7	0	0	21
	1/2SR	1987	93	0	22	19	18	43	31	9	9	0	0	43
	Tactic	2216	87	2	31	19	21	46	12	8	23	0	19	42
May-99	Cont	4039	76	1	37	33	45	44	23	20	15	1	8	16
	1/2SR	3118	87	0	26	32	33	48	29	5	13	0	2	15
	Tactic	3482	89	2	27	19	39	53	18	13	26	0	6	15
May-00	Cont	1348	93	0	21	32	41	44	30	18	7	0	0	15
	1/2SR	999	88	0	21	34	20	53	22	8	17	0	0	15
	Tactic	965	91	2	22	34	12	71	26	10	14	0	0	19
Jun-01	Cont	6078	94	0	33	49	43	18	10	10	6	0	0	37
	1/2SR	3530	87	0	24	44	19	34	16	13	9	0	2	29
	Tactic	4185	92	0	27	38	35	35	16	8	8	0	0	38

Pasture data - Derarby

Proportion of Yield (%)

Date	Pdk	Yield	Hecon	Bobla	Bodec	Aris	Weeds	NLegs	Trag	Chdiv	Sedge
Oct-93	Cont	1385	37	26	10	12	3	0	0	0	0
	1/2SR	1450	20	24	8	33	3	0	0	0	0
	Tactic	1285	29	46	7	6	3	0	0	0	0
May-94	Cont	1745	33	22	9	25	1	0	0	0	0
	1/2SR	2715	25	24	6	24	1	0	0	1	0
	Tactic	2105	37	37	6	10	2	0	0	1	0
Jan-95	Cont	390	20	53	16	6	0	0	0	0	2
	1/2SR	296	33	43	7	13	1	0	0	1	1
	Tactic	373	38	47	5	6	0	0	0	1	1
Apr-95	Cont	940	40	21	14	4	5	1	2	1	2
	1/2SR	1900	28	23	10	12	2	0	1	3	1
	Tactic	1705	51	20	5	9	1	0	2	2	1
Sep-95	Cont	350	29	16	9	28	4	0	1	3	3
	1/2SR	1260	29	26	10	16	2	0	0	3	1
	Tactic	920	53	25	5	9	1	0	1	1	2
May-96	Cont	2695	27	33	11	8	5	2	0	2	2
	1/2SR	3643	31	24	7	8	3	1	0	1	1
	Tactic	3375	27	48	4	6	3	1	1	2	1
Jan-97	Cont	1819	31	44	6	13	1	0	0	0	2
	1/2SR	967	37	23	5	21	6	0	1	1	3
	Tactic	687	42	48	1	5	1	0	0	0	1
Jun-97	Cont	1237	18	37	15	16	3	0	0	3	1
	1/2SR	905	17	19	5	36	5	0	1	3	1
	Tactic	737	25	44	2	16	2	0	1	5	1
Sep-97	Cont	734	17	27	7	32	2	0	0	2	1
	1/2SR	454	24	12	8	39	4	0	0	3	2
	Tactic	358	24	36	2	15	4	0	1	4	1
May-98	Cont	2021	19	26	13	9	5	1	0	2	1
	1/2SR	2654	24	19	8	11	4	0	0	3	0
	Tactic	1192	36	25	4	9	7	0	0	9	1
May-99	Cont	2144	16	26	17	30	1	0	0	1	1
	1/2SR	4020	25	21	9	16	2	0	0	2	0
	Tactic	2746	38	39	5	10	0	0	0	3	0

Derarby **Yield (kg/ha)**

Date	Pdk	Yield	Hecon	Bobla	Bodec	Aris	Weeds	NLegs	Trag	Chdiv	Sedge
Oct-93	Cont	1385	512	360	139	166	42	0	0	0	0
	1/2SR	1450	290	348	116	479	44	0	0	0	0
	Tactic	1285	373	591	90	77	39	0	0	0	0
May-94	Cont	1745	573	382	164	441	14	3	1	2	7
	1/2SR	2715	667	660	163	640	31	6	4	26	12
	Tactic	2105	787	773	131	200	48	0	1	13	3
Jan-95	Cont	390	79	206	61	25	1	0	0	2	6
	1/2SR	296	96	127	22	40	4	0	0	3	3
	Tactic	373	140	177	17	24	1	0	1	3	3
Apr-95	Cont	940	378	195	134	41	43	6	21	9	21
	1/2SR	1900	538	443	188	226	43	7	21	59	28
	Tactic	1705	874	346	84	153	21	6	27	35	15
Sep-95	Cont	350	102	54	33	97	15	1	3	9	11
	1/2SR	1260	360	328	126	205	28	0	4	36	11
	Tactic	920	486	231	43	81	9	0	6	12	17
May-96	Cont	2695	720	883	301	206	127	42	7	50	66
	1/2SR	3643	1129	869	259	291	123	32	2	45	50
	Tactic	3375	923	1608	131	200	87	29	18	63	33
Jan-97	Cont	1819	570	791	105	230	20	2	0	3	42
	1/2SR	967	356	222	46	200	54	2	9	7	32
	Tactic	687	286	331	6	36	10	1	0	1	9
Jun-97	Cont	1237	223	454	188	194	40	0	2	32	11
	1/2SR	905	151	172	50	329	43	2	6	27	10
	Tactic	737	182	326	17	119	18	1	5	38	8
Sep-97	Cont	734	124	201	52	236	13	0	0	11	7
	1/2SR	454	109	53	36	177	20	0	1	15	8
	Tactic	358	87	129	7	52	13	1	2	15	3
May-98	Cont	2021	391	527	268	183	103	27	4	44	21
	1/2SR	2654	637	508	205	294	115	7	1	71	6
	Tactic	1192	435	299	47	107	89	5	2	112	6
May-99	Cont	2144	351	556	370	642	30	2	0	26	22
	1/2SR	4020	1022	827	349	638	86	15	0	65	1
	Tactic	2746	1040	1080	131	268	5	6	0	89	1

Derarby **Frequency of Occurrence (%)**

Date	Pdk	Yield	Hecon	Bobla	Bodec	Aris	Weeds	NLegs	Trag	Chdiv	Sedge
Oct-93	**Cont**	1385	71	45	20	19	77	10	0	0	0
	1/2SR	1450	49	44	17	29	82	13	0	0	0
	Tactic	1285	63	65	15	13	82	17	0	0	0
May-94	**Cont**	1745	66	34	32	33	62	18	3	8	25
	1/2SR	2715	47	35	24	41	66	15	8	25	28
	Tactic	2105	68	50	30	36	73	21	5	19	15
Jan-95	**Cont**	390	64	67	9	9	13	0	0	13	11
	1/2SR	296	63	72	9	24	17	0	2	9	20
	Tactic	373	85	61	5	10	15	0	7	5	17
Apr-95	**Cont**	940	67	30	25	16	53	14	10	4	28
	1/2SR	1900	53	39	25	23	50	11	8	16	21
	Tactic	1705	72	29	23	28	44	13	19	10	10
Sep-95	**Cont**	350	52	29	16	23	65	6	16	10	35
	1/2SR	1260	59	41	29	35	56	5	5	29	43
	Tactic	920	82	34	24	24	34	0	16	16	34
May-96	**Cont**	2695	58	54	16	22	42	28	7	9	25
	1/2SR	3643	43	40	20	25	48	10	2	7	24
	Tactic	3375	55	65	9	28	32	22	3	9	12
Jan-97	**Cont**	1819	46	51	33	23	15	3	3	3	21
	1/2SR	967	55	42	16	32	30	3	3	7	10
	Tactic	687	68	47	5	18	13	3	0	3	16
Jun-97	**Cont**	1237	57	52	4	28	78	18	6	33	30
	1/2SR	905	52	35	12	44	68	7	15	35	26
	Tactic	737	66	54	4	25	76	9	16	51	14
Sep-97	**Cont**	734	58	37	16	34	64	0	3	21	21
	1/2SR	454	53	29	14	2	58	2	5	21	22
	Tactic	358	57	53	4	31	51	13	9	25	13
May-98	**Cont**	2021	61	37	20	22	76	29	3	18	21
	1/2SR	2654	48	35	25	17	81	17	1	21	21
	Tactic	1192	61	42	7	23	74	29	6	28	10
May-99	**Cont**	2144	44	44	30	49	33	5	0	29	8
	1/2SR	4020	55	35	17	37	35	12	0	26	6
	Tactic	2746	61	49	18	53	32	13	1	28	6

Pasture data – Glencoe

			Proportion of Yield (%)								
Date	**Pdk**	**Yield**	**Hecon**	**Bobla**	**Bodec**	**Aris**	**Weeds**	**NLegs**	**Traus**	**Chdiv**	**Sedge**
Nov-93	Cont	2640	1	0	9	75	5	2	2	0	3
	1/2SR	2510	3	1	7	67	7	0	4	0	5
	Tactic	2245	2	1	11	63	6	1	2	1	5
May-94	Cont	1605	9	1	12	62	4	0	0	0	4
	1/2SR	1955	3	1	15	67	4	0	0	1	1
	Tactic	1445	3	1	17	57	3	0	0	0	1
Jan-95	Cont	860	3	4	3	73	0	0	0	0	1
	1/2SR	1060	0	4	10	75	0	0	0	0	0
	Tactic	810	0	3	3	72	1	0	0	0	1
Mar-95	Cont	660	3	0	6	56	9	0	7	0	7
	1/2SR	890	3	1	7	66	6	2	3	1	3
	Tactic	720	10	2	9	50	7	1	2	2	5
Sep-95	Cont	815	3	0	13	70	3	0	1	1	4
	1/2SR	1460	2	1	20	67	3	1	1	1	2
	Tactic	770	2	0	25	57	2	0	1	1	2
May-96	Cont	1409	12	1	14	50	7	2	1	0	3
	1/2SR	2630	3	1	19	58	4	1	0	0	2
	Tactic	1705	9	1	26	47	3	1	0	1	1
Jan-97	Cont	1250	16	2	16	55	5	0	1	0	2
	1/2SR	1317	7	4	16	59	5	1	0	1	3
	Tactic	1170	3	2	37	46	2	0	1	0	4
Jun-97	Cont	1105	4	1	20	58	3	0	0	1	2
	1/2SR	1624	4	2	21	48	4	1	0	4	2
	Tactic	1206	3	2	23	56	3	0	1	1	2
Sep-97	Cont	1289	4	3	14	71	1	0	0	1	2
	1/2SR	1805	4	1	21	60	2	0	0	1	2
	Tactic	1333	2	2	19	66	1	0	0	0	2
May-98	Cont	2436	12	2	20	39	3	1	0	2	2
	1/2SR	3286	7	2	24	43	4	2	0	3	1
	Tactic	2586	7	2	33	36	3	1	0	3	2
May-99	Cont	3875	25	4	18	36	1	0	0	1	0
	1/2SR	3780	16	3	35	32	1	0	0	2	1
	Tactic	3330	10	3	32	39	96	0	0	2	0
May-00	Cont	1131	28	1	18	36	1	0	0	1	0
	1/2SR	1879	16	8	33	30	1	0	0	1	0
	Tactic	870	13	1	28	49	1	0	0	1	0
Jun-01	Cont	689	11	0	17	57	1	0	0	1	4
	1/2SR	1050	11	8	30	37	1	0	0	1	1
	Tactic	438	12	1	27	40	2	0	0	1	3

Glencoe

Yield of Pasture (kg/ha)

Date	Pdk	Yield	Hecon	Bobla	Bodec	Aris	Weeds	NLegs	Traus	Chdiv	Sedge
Nov-93	**Cont**	2640	26	0	238	1980	132	53	53	4	79
	1/2SR	2510	75	25	176	1682	176	0	100	7	126
	Tactic	2245	45	22	247	1414	135	22	45	11	112
May-94	**Cont**	1605	144	16	193	995	64	0	0	7	64
	1/2SR	1955	59	20	293	1310	78	0	0	11	20
	Tactic	1445	43	14	246	824	43	0	0	4	14
Jan-95	**Cont**	860	26	34	26	628	0	0	0	0	9
	1/2SR	1060	0	42	106	795	0	0	0	0	0
	Tactic	810	0	24	24	583	8	0	0	0	8
Mar-95	**Cont**	660	20	3	43	372	59	2	49	1	44
	1/2SR	890	22	11	58	587	55	15	28	8	23
	Tactic	720	70	13	61	362	51	7	13	11	39
Sep-95	**Cont**	815	27	0	106	569	25	0	8	7	32
	1/2SR	1460	34	13	293	983	46	8	12	11	25
	Tactic	770	19	0	190	441	16	0	11	11	14
May-96	**Cont**	1409	170	20	192	704	96	22	12	2	45
	1/2SR	2630	91	33	512	1521	100	38	1	4	42
	Tactic	1705	150	21	438	804	58	13	2	10	21
Jan-97	**Cont**	1250	195	29	206	682	59	4	9	3	30
	1/2SR	1317	98	51	213	780	62	7	5	15	40
	Tactic	1170	35	20	431	544	27	0	14	0	50
Jun-97	**Cont**	1105	48	12	219	639	31	2	5	14	25
	1/2SR	1624	65	37	335	779	67	11	9	58	27
	Tactic	1206	34	20	274	671	35	5	7	13	20
Sep-97	**Cont**	1289	49	36	185	911	5	0	2	8	30
	1/2SR	1805	66	22	384	1088	30	1	3	19	30
	Tactic	1333	27	32	247	862	15	6	1	3	22
May-98	**Cont**	2436	302	45	495	953	84	30	0	49	50
	1/2SR	3286	231	73	776	1400	136	57	3	97	41
	Tactic	2586	171	50	847	941	86	20	4	84	39
May-99	**Cont**	3875	956	138	714	1387	41	11	2	50	8
	1/2SR	3780	612	107	1305	1192	37	17	0	87	23
	Tactic	3330	346	98	1070	1307	32	0	0	76	8
May-00	**Cont**	1131	317	14	208	403	8	2	0	6	4
	1/2SR	1879	300	151	629	555	12	5	0	13	5
	Tactic	870	113	7	242	424	8	3	0	5	3
Jun-01	**Cont**	689	77	1	118	394	9	0	0	2	29
	1/2SR	1050	111	79	312	393	5	1	4	12	14
	Tactic	438	53	3	119	177	9	1	0	3	14

Glencoe **Frequency of occurrence (%)**

Date	Pdk	Yield	Hecon	Bobla	Bodec	Aris	Weeds	NLegs	Traus	Chdiv	Sedge
Nov-93	**Cont**	2640	8	2	40	85	89	50	31	4	64
	1/2SR	2510	14	5	22	75	94	24	30	3	70
	Tactic	2245	10	2	38	81	86	35	20	4	68
May-94	**Cont**	1605	20	3	32	74	76	25	11	4	39
	1/2SR	1955	9	3	49	82	75	45	6	9	34
	Tactic	1445	11	1	44	79	3	25	7	5	36
Jan-95	**Cont**	860	4	12	8	71	14	6	6	0	20
	1/2SR	1060	0	8	43	88	8	0	0	0	2
	Tactic	810	7	13	26	89	16	0	0	0	11
Mar-95	**Cont**	660	12	4	11	65	74	11	38	1	58
	1/2SR	890	12	5	20	82	82	34	23	3	44
	Tactic	720	12	4	22	78	69	19	15	6	50
Sep-95	**Cont**	815	16	0	19	77	81	2	21	14	33
	1/2SR	1460	12	2	33	90	84	22	14	8	49
	Tactic	770	6	0	45	76	73	6	16	4	39
May-96	**Cont**	1409	17	0	24	71	75	17	1	1	47
	1/2SR	2630	7	4	38	80	64	29	1	1	30
	Tactic	1705	13	3	38	72	63	28	2	4	42
Jan-97	**Cont**	1250	30	4	32	62	34	0	4	2	32
	1/2SR	1317	14	5	42	79	26	4	4	9	33
	Tactic	1170	11	5	42	74	21	0	13	0	29
Jun-97	**Cont**	1105	18	5	33	76	78	17	14	13	51
	1/2SR	1624	20	6	56	87	74	41	10	30	47
	Tactic	1206	9	5	38	82	76	15	12	4	44
Sep-97	**Cont**	1289	24	4	38	73	47	10	9	11	53
	1/2SR	1805	18	2	53	90	31	14	3	14	36
	Tactic	1333	13	2	45	87	31	5	38	6	44
May-98	**Cont**	2436	30	0	29	66	78	33	0	9	40
	1/2SR	3286	13	4	50	76	69	48	1	19	34
	Tactic	2586	21	3	53	72	63	26	6	8	38
May-99	**Cont**	3875	33	2	42	73	53	11	1	14	15
	1/2SR	3780	30	6	64	68	18	23	1	15	15
	Tactic	3330	22	6	54	72	16	9	0	13	15
May-00	**Cont**	1131	24	5	39	64	91	36	2	6	29
	1/2SR	1879	38	13	76	70	79	65	5	18	15
	Tactic	870	27	3	47	85	80	38	11	11	21
Jun-01	**Cont**	689	29	2	38	68	34	3	0	9	37
	1/2SR	1050	16	13	55	62	17	7	1	21	25
	Tactic	438	21	4	48	69	31	13	0	13	32

Pasture data - Stanley House

Proportion of yield (%)

Date	Paddock	Total Yield (kg/ha)	SG*	WG	FB	PB	We	NL	Di	Er	Se
Sept 1993	Control	2165	12	43	9	15	0	0	0	0	0
	Half SR	2135	22	35	9	19	0	0	0	0	0
	Tactical	1610	8	40	3	19	0	0	0	0	0
Apr 1994	Control	2490	23	31	1	22	1	0	5	0	0
	Half SR	2955	40	21	4	19	0	0	2	0	0
	Tactical	2160	21	26	2	28	1	0	4	0	1
Jan 1995	Control	815	18	35	2	18	0	1	2	2	1
	Half SR	1535	35	26	10	18	0	1	1	0	1
	Tactical	720	19	34	6	27	0	1	1	3	2
Apr 1995	Control	1700	19	39	4	24	1	1	2	1	1
	Half SR	2285	40	26	5	19	0	0	1	1	1
	Tactical	855	12	39	4	27	1	0	3	4	1

* SG=speargrass: WG=wiregrass; FB=forest bluegrass; PB=pitted bluegrass; We=broad-leaf weeds; NL=native legumes; Di=blue couch; Er=poverty grass; Se=sedges

Yield of main species (kg/ha)

Date	Paddock	Total Yield (kg/ha)	SG	WG	FB	PB	We	NL	Di	Er	Se
Sept 1993	Control	2165	260	931	195	325	0	0	0	0	0
	Half SR	2135	470	747	192	406	0	0	0	0	0
	Tactical	1610	129	644	48	306	0	0	0	0	0
Apr 1994	Control	2490	573	772	25	548	25	0	125	0	10
	Half SR	2955	1182	621	118	561	0	0	59	0	12
	Tactical	2160	545	562	43	605	22	0	86	0	13
Jan 1995	Control	815	147	285	16	147	3	6	16	16	9
	Half SR	1535	537	399	154	276	3	9	9	0	12
	Tactical	720	137	245	43	194	1	4	9	20	12
Apr 1995	Control	1700	323	663	68	408	14	9	27	9	15
	Half SR	2285	914	594	114	434	5	5	11	11	11
	Tactical	855	103	333	34	231	8	3	22	38	10

Frequency of occurrence (%)

Date	Paddock	Total Yield (kg/ha)	SG	WG	FB	PB	We	NL	Di	Er	Se
Sept 1993	Control	2165	53	57	28	55	63	41	2	0	0
	Half SR	2135	68	57	35	61	72	55	2	0	0
	Tactical	1610	30	47	15	55	44	27	4	0	0
Apr 1994	Control	2490	54	42	5	71	40	47	27	0	30
	Half SR	2955	78	41	12	63	38	66	17	0	24
	Tactical	2160	40	36	5	72	38	46	24	0	28
Jan 1995	Control	815	61	37	10	73	5	8	13	19	19
	Half SR	1535	79	29	44	69	0	3	10	0	13
	Tactical	720	44	44	15	84	2	7	15	18	20
Apr 1995	Control	1700	58	53	8	72	46	44	35	9	64
	Half SR	2285	81	48	22	67	42	50	26	4	64
	Tactical	855	33	41	4	74	36	38	41	55	50

Appendix 2: Review of outcomes from the SWAMP Project, NAP3.209

Project COMP.041 Phase 2
McCausland Associates
28 September 01

Introduction

The purpose of this study is to review the economic, environmental and social impacts of the Project NAP3.209 "Restoring the condition of degraded black speargrass pastures in the southern speargrass zone", also called the Speargrass, Wiregrass, Animal Management Project (SWAMP).

A 1996 Queensland Department of Primary Industry press release described the purpose of the project as 'to demonstrate how annual burning and light stocking could improve the condition of degraded black speargrass pastures dominated by wiregrass, an unproductive grass usually left ungrazed by cattle'……. 'It evolved from detailed experiments at Brian Pastures Research Station, Gayndah, that showed annual spring burning for 3 years, coupled with summer destocking for 4 to 6 months or reduced stocking rate by half, would restore pastures to a better composition of less wiregrass and more black speargrass'.

A feature of the project was the strong producer involvement, both through the location of the demonstrations on commercial properties, and through the producer group involved in each demonstration having control over the management of one of the three treatment regimes employed.

Project objectives

- Objectives for the project, as set in 1996, were:

(a) By the year 2000, develop cost efficient whole property management principles that will enable individual landholders to transform wiregrass infested pastures into productive speargrass pastures.

(b) To demonstrate those management principles and encourage their adoption through a planned communication strategy.

(c) By the year 2000 have producers in the Burnett armed with the knowledge of these management principles and how to apply them as part of their whole property management.

Review approach

The approach taken has been to:

- Read relevant literature on SWAMP, including the 1996 'Interim Final Technical Report, the August 1997 Milestone Report, the 1998,1999 and 2000 Annual

Reports, and an MRC Research Impact Assessment entitled Attachment A, Cost/Benefit Justification for Project.

- Discuss the project results by phone with the Project Leader, beef producers and others as required. A list of those interviewed is shown at Attachment 1.

- Discuss the project results with Rob Rendell of Rendell McGuckian Agricultural Consultants and arrange for him to analyse them through the on-farm assessment tool designed for MLA. This report is attached at Attachment 2.

Results of the review

Technical success

The project has been successful in achieving its objectives and in particular:

- Has enabled producers to make better decisions about their pasture and stock management through the knowledge they have acquired of the principles involved.

- Has shown that restoration of degraded speargrass pasture to a sustainable speargrass pasture is practically feasible on commercial properties, and quantified the cost and time to do so.

- Has demonstrated that producers and researchers/extension staff can form a dynamic partnership when each group has a key role in the conduct of the project at hand.

Level of uptake of the technology

Current:

Uptake is very high among the 41 producers who participated in the project at the time of the survey. A DPI&F survey of these producers, with 22 replies, showed that they had learnt about pasture management. Interviews with participating producers as part of this study indicated that they have learnt the principles involved in management of speargrass pastures, and used them to confidently make decisions which suit their particular circumstances.

There is little evidence that this excellent level of uptake has spread to producers outside the project, although some of those interviewed thought that more producers were burning than was the case before the project results were known.

Future:

The model used, of producers involved in a commercial property demonstration trial on an equal footing with DPI&F experts and with DPI&F administrative support, has proven very effective in transferring knowledge about speargrass management. While it is unlikely that a high percentage of producers will want to be involved at this level of intensity, the technology can certainly be spread further if funds are available for additional demonstration trials and producers are keen to participate in them.

The model has been so effective in forming a productive relationship between DPI&F experts and the participating producers that it is worthy of consideration for wider use in dissemination of other technologies.

Financial benefits

Cost benefit analysis:

DPI&F used the MLA's Research Impact Assessment (RIA) model to determine the Net Present Value (NPV) worth of the project, comparing a control property with increasing proportions of wiregrass infested pastures with a property where stocking rate was reduced and paddocks were burnt each spring to restore the pasture. Gross margins for both properties started at $10.32/hectare/year. After 25 years the gross margin for the control had reduced to $6.14 compared with $13.43 for the other property.

Based on these figures, which were derived from the results obtained in the SWAMP project and the original research on which it was based, the NPV was $80 million at a discount rate of 5% and $37 million at a 10% discount rate. However the estimated adoption rate among producers was not quoted.

On- farm assessment tool:

Rob Rendell has run the model comparing a control property with a degraded pasture with a similar property that restores its pastures through burning and a lower stocking rate. The results of the analysis are shown in Attachment 2.

A key assumption included in the analysis is that the beef production from the control property reduces by 15% over 25 years. Other assumptions include:

Treated	(% Change)
Stocking rate	-25%
Weaning rate	16%
Liveweight price	14.6%
Stock selling age	40%
Cost of supplements	-37.5%
Other operating costs	-25%

Based on these assumptions, the value of the project to those who adopt it is $. This figure does not account for any increased capital value of the treated property as a result of it superior pastures.

Environmental benefits

The environmental benefits are considerable and of great importance. The project has demonstrated, on commercial properties, how a degraded native speargrass pasture can be restored to a sustainable and much more productive state at a defined cost and a defined time period. It provides a practical solution for those producers caught in a downward spiral of overstocking and increasing pasture degradation.

Social benefits

Producers spoke of the value of the group in learning how other producers manage in situations common to them.

Industry comment on SWAMP

The project structure

Producers were very positive in their praise of the way the project was organised, particularly in relation to:

- producers having real influence
- input from DPI&F and other experts
- administrative support from DPI&F.

Comments included:

- It's a good way to do it and we needed DPI&F – they were always asking for our comments – we definitely need DPI&F involved. It's a good system where producers decide what they want to do.

- It was a great aspect that the producer felt it wasn't something coming down from on high….we wouldn't have had the ownership if we hadn't been influential.

- We guided the department with some facts. It was a two way street in exchange of information.

Benefits

Producers commented on their greatly increased knowledge of pasture related matters as a result of the project and the fact that they can now adapt this knowledge to their situation. Comments included:

- It vindicated what we were doing on some country and caused us to change our practices on other country. It has had quite a dramatic impact and has had an effect on dollars.

- *I am now more focussed on observing the state of pastures and grazing pressure…I used to not burn until October and now burn much earlier and have cooler fires.*

- I found that the country needs a spell after burning and the project helped producers make better decisions about the timing.

Sustainability

Producers gained confidence that they could manage speargrass pastures sustainably. Comments included:

- From productivity and a sustainability point of view it has been good for my business….I found out how to maintain speargrass and get the best out of that species.
- I can see long term benefits in sustainability and get better productivity too.
- It is real that you can restore pasture on a heavily stocked property.

Duration of producer groups

Several producers commented that it should be recognised that producer groups have a limited life. Comments included:

- One negative is that commercial producers can't take the losses from the control for too long.
- Six years is long enough to do the trial.
- It has contributed to expanding the possibilities of management but it would be stale to keep on with the same team. But the benefit will continue by having done it.

Conclusions

Through this study it is concluded that:

- The project has achieved its stated objectives and has been able to demonstrate practical ways for managers to restore degraded speargrass pastures.
- The project has been effective in achieving real change among and benefit to the participating producers, but has not had much effect to date on other producers.
- The model of producer participation with DPI&F experts in a commercial property trial, where producers have a real influence on project decisions, resulted in a real partnership of value to both groups. It is a model worthy of consideration for transfer of other technology to producers.

From the perspective of a triple bottom line assessment, it is concluded that the SWAMP project has had:

- A definite and quantifiable economic benefit to industry individuals and the industry generally.
- A very important environmental benefit by showing how degraded speargrass pastures can be restored with an economic benefit to individual producers.
- A beneficial social effect, by providing a vehicle for farmers to gain support from other producers and the community of experts who are able to assist them.

ATTACHMENT 1

People interviewed

Shane Blakely,	MLA Northern Beef Coordinator, Toowoomba
Pat Connolly,	Beef Producer, Eidsvold
Richard Grimes,	Beef Producer, Proston
Col Paton,	DPI&F, Brian Pastures
Rob Rendell,	Rendell McGuckian Agricultural Consultants
Col Seiler,	Beef Producer, West Boondooma
Shane Walsh,	Beef Producer, Toowoomba

Appendix 3: Case studies

Case study 1 – Seiler Family

Pastures and production intensify at Killara

NEW watering points, intensive pasture management through stock rotation, and a swing to feedlot finishing have geared the Seiler family's Boondooma property Killara towards better drought tolerance.

Brothers Col, Pete and Phill Seiler and their wives Joan, Lynnelle and Lyn run the 28,000-hectare aggregation of country including State Forest grazing lease, granite sand, brigalow and softwood scrub.

During the last decade — spurred on by dry seasons and a swing to a high growth rate composite herd featuring Chianina blood — they have moved the enterprise from bullock breeding and fattening to breeding with the domestic grain-finished market in mind.

Mr Seiler says while the operation is more intensive, it is also more predictable and they have 'more control over events'. Inputs, notably feed, are important so a nearby DPI&F pasture trial on the Grimes family's property Corrunovan sparked their interest.

The three-year Speargrass Wiregrass Animal Management Project (SWAMP) lead by DPI&F extension officer Col Paton was run over three sites in the Burnett and measured the effect of regular burning and stocking rates on native pastures and weeds.

"Native pastures in Queensland's southern speargrass zone are prone to infestation and degradation by wiregrasses," Mr Paton said.

"A number of factors including extended droughts, economic pressures causing overstocking, and a lack of seasonal pasture burning cause wiregrass dominance.

"But SWAMP evaluation showed the producers who took part have a good grasp of the management strategies needed to change pasture composition and use those strategies when appropriate."

Mr Seiler said the SWAMP site at Corrunovan was on granite sand country similar to that found on parts of Killara and the trial was timely for him.

He said the Killara operation was in transition from running high numbers and set stocking to rotational grazing so initially there was little feed left to burn for canegrass control.

But 'orchestrated burning' and a 'religiously adhered to rotation program' has made the SWAMP recommendations more applicable. In the forest country the Seilers burn every four years and more frequently on the sandy country.

"We have discovered interesting results similar to the SWAMP trial on our own GrassCheck sites in relation to the proportion of canegrass relative to spear grass.

"The canegrass was hugely diminished by burning; but for the SWAMP trial we definitely wouldn't have been that scientific in terms of observation."

Mr Seiler said the SWAMP trial focused him on levels and quality of available pasture. He said the success of SWAMP was largely due to the group of producers who were 'looking to learn' and receptive to DPI&F messages.

A drought-time flight over the property convinced the Seilers to look to rotational grazing which Mr Seiler described as 'less labour intensive' than cell grazing.

"There is a bit of a trade off between stock condition and pasture levels but it is important to look at pasture quality and what parts of the plant have been eaten."

Conservative overall stocking rates range from a beast to 6-8ha on the sandy country to a beast to 40ha on the forest leases. During the grazing phase of the rotation the stocking rate may be up to a beast to 1ha on granite sand country but it may be left destocked for more than 12 months during the rest phase.

The investment of subdivision, bores and about 30 new dams has helped the property become more drought tolerant. Supplementary feeding is also important in the operation.

"With high European content you have to attend to your inputs more but the upside is that the growth rates in the feedlot make it profitable at that stage of the game."

Fodder crops including summer legumes such as lablab and some sorghum are grown for high-need stock classes on the productive brigalow country, along with oats when seasonal opportunities arise.

"We buy a lot of molasses-urea to keep our breeders and weaners productive, and we use bought grain as a stop-gap to ensure animals are performing rather than marking time if the crops or pastures are late.

"With a lot of poor breeder country like we've got it's a production input but it's also insurance, because if you can pick the season and get ahead of the game so you are supplementing your cattle before they go down hill, you don't fall in a heap."

Mr Seiler says computer records of weight gain and interest payments have shown him how important timing is in the operation.

"The country that used to run bullocks is now running the young cattle and breeders with the highest nutritional requirement such as first-calf heifers," Mr Seiler said.

Pasture performance has become more important as the operation has intensified and the Seilers have moved to stock rotations and put in new dams in order to use the available feed more efficiently.

The property now runs close to 1000 breeders and Mr Seiler says Killara's 80-year evolution from settler's block to dairy farm to efficient beef 'factory' has been satisfying for the family.

The herd that began with Hereford genetics 40 years ago is now dominated by Chianina blood with infusions of Santa Gertrudis.

“We became excited about the growth rates and yields of the European cattle, but it became very difficult to fatten those high growth rate cattle at a young age because all they wanted to do was grow, so between that and the drought we leaned towards feedlots.

“We had six to seven really dry years in the early to mid nineties and the seasons have remained erratic ever since so I’m not particularly sorry that we’ve swung that way.

“Also, to fully exploit the growth potential of these European-cross cattle you’ve got to get into that high plane of nutrition — they are ideal cattle for feedlots.”

Case study 2 – Grimes Family

Managing for market flexibility on Corrunovan

Nutrition and carcase quality are the key weapons in meeting production and income targets for South Burnett beef producers, the Grimes family. Native pasture management, crossbreeding and stocking rates play major roles in their property and herd management.

Aiming for market flexibility

The Grimes family, made a conscious decision to steer clear of hormonal growth promotants (HGP) and to rely instead on genetics and well managed native and sown pastures for weight gain.

In doing so they sacrificed earlier finishing for market flexibility but Richard Grimes said the emergence of the European Union market had validated their decision.

Richard is currently booking cattle into an EU-accredited feedlot and is pleased with the premium being offered for EU cattle despite the extra reporting requirements.

"Using HGPs was something we just never did in our operation because it was an extra job and we didn’t agree with the principle of using hormones," Richard said.

"People said that there was an advantage but we were doing quite well without them." Richard and his wife Julie operate a 9500-hectare amalgamation of several forest and scrub blocks with Richard’s parents Gerry and Margery, including the home property Corrunovan, near Proston.

Julie says the new EU market provides an attractive alternative to Jap-bullock or local trade markets.

"We try to adjust to the markets available and the latest is the EU market so we are accredited for that," Julie said.

"The EU prices that were offered last year are the main attraction but I feel that we don’t know the eventual outcomes of giving cattle HGPs.

To me, food safety is a concern and from talking to other people, particularly mothers, I think there is a concern about what people are consuming in beef.

I feel that requirements for many markets, like the EU market, are going to be common place in the future in that they will require some national identification scheme to identify, trace and ultimately control the quality and safety of the product."

She says being able to sell cattle at several different points including saleyards, feedlots and abattoirs and targeting different markets such as the EU market is a risk management strategy that works well in the Grimes' operation.

The EU market requirements have prompted the Grimes to update their identification system and link this to production and breeding performance. They will be using the reporting requirements as an opportunity to record and use data about their herd.

Breeding for local conditions

The Grimes started with a Hereford herd that was crossed with Brahmans when they felt the cattle needed tick resistance. The advantages were two fold — less chemical usage and lower costs. Santa Gertrudis, Charolais, Droughtmaster and Charbray bulls have all been used since the initial introduction of Brahman bulls.

"It is fairly hard country and the grasses that the soil grows don't have high protein content, especially through the winter when the frosts have done their damage, so the cattle need to be able handle that," Julie said.

"The Brahmans were brought in for durability, to handle the conditions such as ticks and drought.

The Charolais were chosen for structure and a better finished beast for the Jap Ox market."

We do all our breeding on the forest country and then send the steers up to the scrub country to be fattened. Even with the harsher conditions, the forest country is excellent for breeding."

The Grimes supplementary fed cattle through last year's dry winter in order to preserve their genetic gains but Julie said each feeding experience was different.

"Each year the strategies change; it's never the same drought and never the same cattle and there are never the same markets so things are constantly changing.

Last year we ended up feeding every female beast on the property because breeding is our mainstay, and the previous season was particularly hard on our breeders."

Managing for better pastures

The Grimes family was involved in a DPI&F pasture management demonstration as part of the Speargrass Wiregrass Animal Management Project (SWAMP).

The demonstration was run on Corrunovan, where the stemmy, unpalatable native, canegrass, was a big problem and presented similar challenges as another poor quality native grass, wiregrass.

Results showed that undesirable grasses such as wiregrass and canegrass were controlled with practices such as lighter stocking rates and annual burning and overall these were beneficial to pastures.

Julie said the demonstration reaffirmed some of the management practices that were in place on Corrunovan.

“When comparing the demonstration sites — that is the three different paddocks used — it was easy to see the results of the different managements in each of these paddocks and the effect each management option had on the various grasses.”

She was involved with the demonstration in several ways: from measuring the amounts and species composition of pastures in their native pasture paddocks to observing pasture growth and cattle weight gains.

"When I’m riding around the paddock now it’s really interesting to see what cover and what sort of grasses are there and to notice what grasses are increasing and what aren’t.

I’ve become much more attuned to differences in pasture species, pasture yields, and effects of management but we haven’t actually changed a lot of the practices on our property because we have always understocked Corrunovan to enable a reasonable body of feed.

This is needed to feed the cattle through the winter months and to carry a decent fire after spring rains."

Because wiregrass was not the problem it was on other properties in the demonstration, Corrunovan focused on canegrass, which was taking over in several areas.

"We found burning reduces the clumps of canegrass and also helps the speargrass to germinate and get away."

The Grimes burn each year but the demonstration revealed that burning every two to three years was more beneficial to pasture growth once pastures were in good condition.

"That also helps wildlife, too, because you’re not burning the habitat of small birds, native animals and young trees, where you want some more trees to come through." Julie said.

She said SWAMP was successful in bringing the local group together to exchange information and members were well attuned to the advantages of looking after their pastures, but outside the group there was still plenty of overstocking happening, which had devastating results on pastures and soil conservation.

“One of the most beneficial gains of the SWAMP demonstration and group was the interaction between researchers and property owners,” Julie said.

“It was bringing together the results of trials and the ideas of cattle owners. It was putting the research into practice on a larger scale in a real property situation.

This was important to me as a link between government research and the managers of grass roots primary industry, which I fear in the future will fade into non-existence.”

Julie said getting the farmers and researchers together was valuable for an exchange of new ideas and practices.

"For example, the use of urea seems to change every year so you learn how much you can give a beast and how much you can't."

Richard agrees it is important to keeping learning in agriculture and tries to keep up with new technology and research.

"Learning is on-going but when it all comes back to it the important thing is what you do specifically back on the property, that's where you're going to make your money in the long run".

Case study 3 – Elliott Family

Derarby benefits from optimising speargrass stands

Using effective wiregrass control to optimise speargrass stands was the next best thing to establishing costly improved pastures for Central Queensland beef producers Ross and Joan Elliott.

The Elliott's hosted a three-year DPI&F wiregrass trial as part of the Speargrass Wiregrass Animal Management Project (SWAMP) on Derarby, near Mundubbera and have since sold the 2633 hectare property.

Ross was interested in improving the nutritional and groundcover value of the pasture through improved exotic pastures but was put off by the cost involved and the erosion-prone nature of the country.

"I was interested in improved pastures but thought they were pretty dear so if we could improve native speargrass pastures cheaper, then that might be the way to go," he said.

The trial taught him grazing and burning strategies for wiregrass management. Monitoring of stands was important to the trial, as wiregrass was unpalatable to stock when it grew past the seedling stage. Identification at early stages of growth allowed Ross to assess stands more accurately.

"Wiregrass is useless for cattle because there is no leaf on it and once it gets over about three inches high the stock don't touch it because it's just all stalk," he said.

"I used to walk around with Col Paton while he was doing the grass sampling and I picked up quite a bit from that; I learnt how to identify the young wiregrass seedlings better.

"Wiregrass and speargrass looked similar to me when they were young but once Col explained it and showed me I could see they were totally different seedling plants."

He said speargrass was a distinctive flat-bladed seedling, while wiregrass was round like forest bluegrass.

"We didn't have that big a wiregrass problem on the property," Ross said.

"It was about seventy per cent speargrass in the trial paddocks and when we finished there it was getting up to around the 75-80pc of speargrass and forest bluegrass."

DPI&F officers recorded data on Derarby from 1993 to 1996 in order to map the progress of three plots:

Normal property stocking rate and no burning (control paddock).

Half the normal property stocking rate and burnt in spring each year (half stocked paddock).

Burnt each year in spring and destocked for various periods in the growing season (tactical paddock).

The half stocked paddock was adjusted to three quarters of the normal property rate and burnt annually when the producer group tapping into the learning opportunity at Derarby suggested the pastures were in good condition and being under utilised, particularly in 1995-96.

SWAMP project leader, Col Paton, said pasture yields were almost double in the three-quarter stocked and burnt paddock as they were in the unburnt and fully stocked control paddock.

"Yields of the better pasture species, black speargrass and forest bluegrass, in 1998/99 were 1845 kilograms/ha and 2120 kg/ha in three-quarter stocked and tactically stocked paddocks compared with only 905 kg/ha in the more heavily stocked control paddock," Mr Paton said.

"That year the three-quarter stocked paddock performed best in kilograms/head and the tactically stocked paddock had the best kilogram/ha weight gain."

Ross said he wasn't sure how to approach the wiregrass problem when he moved from Biggenden close to a decade ago but followed the established practice in the district of burning every second spring or when grass cover could carry a flame.

"I wasn't really surprised at what the DPI&F scientists were recommending," Ross said.

"I just took it in and I learnt a lot from it and it was a successful trial in what I learnt and in reducing the wiregrass problem."

It wasn't just Ross's weed identification knowledge that was improved through the SWAMP trial. He said weighing of young cattle running on the site every three months gave him valuable benchmarks for the performance of the whole herd.

This was particularly important for the Elliott's grain-finishing program that turned off 11 head/month after 100 days on a ready-mixed, steam-flaked grain mix.

Cattle went into the feedlot at 400 kg liveweight and were sold to South Burnett meatworks (and later to Teys Brothers, Beenleigh) at 370-375 kg dressed carcass weight.

The 80-head operation averaged a weight gain of 2.5 kg/head/day for both steers and heifers and the top gaining steer averaged 3.75 kg/head/day.

“One year we stepped up the stocking rate on the half-stocked trial paddock to three-quarters (of normal rate) and we agreed that if it turned dry I would pull out the excess numbers and bring it back to the half-stocked rate,” Ross said.

“I took out the steers, about 12 head, and they went into the feedlot in May/early June and the average liveweight was 360 kg and they came out at 0-2 tooth, 344 kg dressed.”

Ross was initially running a 200-head Santa Gertrudis breeding herd on Derarby but introduced a Santa x Charbray cross breeding program at the suggestion of Gayndah-based DPI&F beef extension officer Russ Tyler.

“I was trying to get some of the fat off the Santas,” Ross said.

“It brought the (post-feeding) age down and the weight up, while the weight gain in the feedlot stayed about the same.

“Charbray also increased the Brahman content, making tick control easier.”

He said hosting the DPI&F trial in good seasons was a pleasant change to the dry years of the nineties when the 28-inch average rainfall was reduced to 16 inches in one year followed by 14 inches the next.

The dry years made it difficult to burn to control wiregrass and in overall stock and property management but the on-property feedlot opened new options.

“The drier it got, the more cattle I put in the feedlot,” Ross said.

“That was the way we reduced numbers and I started feeding the rest with fortified molasses.”

He said the feed mix became quite expensive but the outlay was offset by buoyant prices for grain-finished stock. It also left more grass for the cattle left in the paddock.

Although now in retirement, the Elliotts retain an interest in the beef industry through a block of leasehold land near Mt Perry.

Case study 4 – Hutchinson Family

Dry seasons hamper wiregrass burns

DRY winters have hampered efforts to burn spring wiregrass stands in the Burnett despite widespread producer agreement that DPI & F’s Speargrass Wiregrass Animal Management Project (SWAMP) recommendations are well-founded.

Eidsvold graziers Bruce and Vivien Hutchinson are keen to adopt the strategies they saw working in SWAMP trials on the neighbouring property, Glencoe, but have opted for pasture improvement on country suitable for stickraking in lieu of widespread burning.

Bruce says he agrees with lighter stocking and spring burning to manage wiregrass but profit and dry years must be considered.

“We’ve got to be able to afford to light stock and still meet our own costs,” Bruce said.

“If we’ve got to light stock in order to get a body of feed to burn, I don’t know how many people will be able to afford to do that.”

The Hutchinson’s property, 10,500-hectare Tireen, is a mix of silverleaf ironbark, narrowleaf ironbark and spotted gum country. They turn off Santa Gertrudis and Brangus steers into the European Union (EU) market via their scrub block and an accredited South Burnett feedlot.

Initially attracted by the 40 cents/kilogram premium, Bruce has been pleased with the EU market returns to date but says restrictions on opportunity trading and agistment have limited his options.

He will give the EU trade another 12 months before deciding whether to continue supply.

Rhodes grass and creeping bisset bluegrass pastures have been successfully established on 300 ha of silverleaf ironbark country after stick raking.

“We’ve developed some quite good pastures but we’re not sure how sustainable they will be” Bruce said.

“It’s not real fertile country so we don’t know if the wiregrass will come back or how long the introduced pastures will last, we’ll just have to be careful with our stocking rates and hopefully it will rain.”

Bruce says another summer will make the difference but after three years the pastures are showing signs of choking out wiregrass and he is pleased with the result, despite the expense.

“It’s expensive to pull the country, then rake it, then seed it but it’s quicker and showing a lot of promise.

“Burning wiregrass stands like we were doing with the SWAMP trials is moderately successful but it might take a long time to see any changes.”

Bruce says if buoyant beef prices are sustained he will be able to fund further pasture improvement and include legumes such as stylos and wynn cassia. In the meantime he is keen to take up the SWAMP recommendations to burn early in spring.

“Wiregrass is the first grass to green up with even a little bit of rain as it has a hard stem and won’t burn readily so it is important to burn before it gets green.”

Bruce and Vivien came to the Eidsvold district about seven years ago from Theodore and say the SWAMP trial and other DPI&F information helped them make the transition.

"It's quite different country and SWAMP started the year before we came here so we were able to participate in the early stages.

"We've learnt a fair bit from the trial and I think it was successful because a lot of people have the same problem and were keen to discuss ways to combat it."

Bruce said the true value of SWAMP was getting producers together and providing the opportunity to swap information.

He said visiting other properties and discussing management options with other graziers had been particularly beneficial, as had using DPI&F officers as sounding boards for ideas and strategies.

Case study 5 – Ryan Family

Small paddocks, spelled often boosts pasture quality

SMALL paddocks, spelled often is the key to boosting native pastures and managing several classes of stock in Des and Edith Ryan's bullock breeding and finishing operation.

The Gayndah-based producers run about 600 head on two-properties, Avalon and Mingo Crossing.

The 2835-hectare aggregation is made up of former dairy farms and the small paddocks, watered by dams and windmills, allow the Ryans to regularly lock away paddocks for spelling and pasture rejuvenation.

"We use some and lock some up for a while but it's not what you would call cell grazing," Des said.

"We've done a fair bit of cutter-barring and seeding in the last couple of years but the with weather the way it's been some paddocks haven't had stock for eighteen months," he said.

"We haven't had enough rain to get it going properly up until this season."

Des said the conservative stocking rate, pasture spelling, and burning in spring had benefited pastures, while having the added benefit of controlling wiregrass.

Des was part of the producer group working with DPI&F officers to oversee the Speargrass Wiregrass Animal Management Project (SWAMP) trial on Ross and Joan Elliott's former Mundubbera property, Derarby.

He said the project was a good opportunity to learn more about wiregrass control, raise questions on cattle and pasture management other with DPI&F officers, and to discuss local concerns with fellow producers.

"It was a good project for the country," Des said.

"Until I got involved in it I didn't really see it as a problem but it seems to be a problem in country that is overstocked.

"Having smaller paddocks allowed us to rotate stock and this worked in our favour."

Des was able to use stocking rate principles seen on the Derarby trial as his soil and vegetation was similar.

Apart from patches of wiregrass he says his country is fairly clean of weeds and although he hasn't changed his management practices, Des says the trial made him more aware of the number of wiregrass varieties and key management strategies.

"It has made me aware that you've got to look after the country and try and spell it after it's burnt to try and beat wiregrass," he said.

"I think that's the secret of the wiregrass problem: lighten the country to let the better grasses get a go on after it is burnt.

"That's what I try to do, to move the cattle to another paddock, burn and let the better grasses get a chance to establish before the cattle are moved back."

Des prefers to burn every year to prompt fresh pasture growth but recent dry years have hampered his efforts. This season the property has a good body of feed as numbers were lightened over the dry winter.

He says pasture regeneration is the primary reason for burning but wiregrass control is an added bonus.

Although Des originally ran a Santa Gertrudis herd, this had been superseded by a Brahman/Droughtmaster cross that allowed him to meet Japanese Ox market specifications.

He said being able to finish younger cattle on grass prompted the change. He markets bullocks less than four years old directly to processors at 320-360 kilograms.

For the past eight years seca and fine-stemmed stylos and creeping bluegrass have been sown to enhance existing stands of speargrass and forest bluegrass.

"We breed on the scrub country and there are only some pasture varieties that will grow in the loam country where we fatten the bullocks," Des said.

"It's a problem as far as breeders is concerned, having these small paddocks, because if you want to keep them segregated you've got have a heap of bulls."

He says the SWAMP trial has changed the way he views feed stands.

"Since I've been involved in the project I can tell, just driving around, what paddocks have good feed and where it's just wiregrass," Des said.

"The only problem I had with the project was that it was preaching to the converted.

"There are a lot of people that could or should have been there that weren't.