Economic Profile of Graziers in the Queensland Mulga Region

A summary report

officers of Economic Services Branch

This publication was prepared for Queensland Department of Primary Industries officers. It may be distributed to other interested individuals and organisations.

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ACKNOWLEDGMENTS

1. INTRODUCTION

The semi-arid mulga region of Queensland is an important wool and meat producing region covering approximately 13% of the State's land area. The area contributes around 25% of total State wool production and is also important for beef cattle production.

The bases for the region's importance are the native grass species and the mulga tree, a type of acacia, which provides an excellent source of feed during drought. Over the last few decades, land degradation has become a major concern and many graziers fear that productivity will decline. The main features of degradation are a decline in native grasses, an increase in woody weeds which are of little or no grazing value, and extensive sheet and gully erosion. Degradation is thought to have occurred as a result of heavy grazing and the frequency of drought during the main growing season in recent years.

A range of historical and economic factors are thought to have contributed to the over-utilisation of the mulga pasture lands. For historical reasons, many properties are smaller than a minimum living area. The subdivision of the large stations into small properties after World War I was a product of the social and political needs of the time and demonstrated a lack of understanding of the fragile mulga environment. For all graziers and especially those with smaller areas, recent economic pressures such as high input costs, high interest rates and debt pressures are thought to have further contributed to excessive grazing. These economic problems have been more severe for the smaller properties. The high costs of transport, communication, education and living have placed additional financial pressure on all graziers.

The increasing awareness of environmental issues in general and specific issues such as degradation in recent years have led to the need for more information on areas such as the mulga. The QDPI has a deep involvement in research in native pasture areas, and considerable work has been done on evaluating the extent of degradation, the physical causes and possible solutions.

Over the three-year period 1985-86, 1986-87 and 1987-88, the mulga region carried approximately 320 000 beef cattle, or 3.6% of the State's beef cattle population. The sheep population of some 3.6 million in the four shires represented 25% of Queensland's sheep numbers. Similarly, wool production was about a quarter of total state output.

Average gross total value of production was $127m, mostly in livestock products. The region produced 15% of the State's total gross value of livestock products and 3% of livestock gross value. Since the late sixties, wool productivity growth in the mulga shires has not matched the Australian average, and sheep numbers in the mulga shires have fallen over a period when national sheep numbers have risen. Cattle numbers in the mulga have not risen as rapidly as the national average.

1.1 Project objectives

The objectives of the study were:

. to review and assess the current financial performance of predominantly mulga grazing properties;

. to identify the factors which influence stocking rate decisions of mulga graziers; and

. to identify and review policy options for rangeland preservation.

The first objective was met by means of a survey of randomly selected mulga graziers. The data were compiled to provide a financial profile of graziers and to allow a comparison with other rural industries.

The financial and production data collected in the economic survey were combined with data collected from a land condition survey. This survey was conducted by QDPI staff in the Land Resources and Pasture Management Branches.

1.2 History

European settlement of the south-west corner of Queensland began in the 1860s. The 'Unoccupied Crown Land Occupation Act of 1860' allowed initial leases of 64 km^2 and later 256 km^2, with no limit to the number of leases held by individuals. By the 1880s, when drought, falling cattle prices and rabbit and dingo problems forced many pastoralists to leave, the remaining graziers controlled vast areas of land. 'The Crown Land Act of 1884' provided for the amalgamation of small leases to form large pastoral holdings.

The availability of water only along the drainage lines of the area forced early graziers to adopt an almost nomadic grazing system. This changed with the first tapping of artesian water in the 1890s, and the subdivision of pastoral holdings into closer settlement blocks for returned World War I soldiers. These events led to a greater utilisation of the area.

The subdivision policy and a European approach to management led to a consistent reduction of biomass. As a result, fires which naturally controlled the outbreak of woody shrubs became a rare event. The fire sensitive plants such as Acacia (including mulga), Dodonea and Eremophila shrub species became more common (Mills 1986.) The decrease in competition from the more palatable perennial grasses aided substantial establishment of these less desirable species. This process was accelerated by the practice of retaining stock and feeding mulga during dry periods. This ability to maintain stock numbers during dry times by the use of mulga top feed led to the situation where stock numbers were high during the crucial post-drought period. At this time grasses were struggling to recover and set seed for the next dry period. The pressure on grasses through grazing in these periods led to very little opportunity for the grasses to expand and provide adequate ground cover in good seasons.

This combination of inappropriate land administration and management strategies suited to a less fragile environment, has contributed to extensive degradation in the mulga lands of south west Queensland (Mills 1986).

1.3 Land tenure and administration

Land tenures in the mulga region reflect the framework originally established by the 'Crown Land Act of 1884'. Most properties are Pastoral Holdings with 30 year leases, and with no area limitations. Freeholding leases constitute only a small proportion of total area.

Land rents were initially based on carrying capacity in average seasons. Carrying capacities were determined with historical information and may no longer be relevant in severely degraded areas. Unfortunately, historical carrying capacities are often used as a basis for property valuation and for securing finance. Many graziers and bankers may have been misled by these historical references and this may have further contributed to financial hardship and over-utilisation of resources.

The concept of a living area was first introduced in the 'Land Act of 1927'. At this time the Land Advisory Board recommended an absolute minimum area as being the area able to support 5000 sheep. It was deemed desirable that areas support 6000 sheep. Since this time, the settlement policies were more soundly based, although settlement took precedence over expansion until the late 1950s. In the last 30 years, settlement and subdivision has ceased, and the amalgamation of blocks has been encouraged.

1.4 Economic importance

The economic importance of the mulga region is demonstrated in Table 1.1, which contains ABS production data for the four main mulga shires. The data in the table are the average of the three financial years 1985-86, 1986-87 and 1987-88. The four main shires with approximate proportions under mulga are Paroo (65% mulga), Murweh (75% mulga), Quilpie (75% mulga) and Bulloo (30% mulga).

Over the three-year period, the region carried approximately 320 000 beef cattle, or 3.6% of the State's beef cattle population. Most cattle in the region were in the Bulloo and Murweh shires and were likely to be concentrated in non-mulga areas, particularly in the Bulloo shire.

The sheep population of some 3.6 million in the four shires represented 25% of Queensland's sheep numbers. Similarly, wool production was about a quarter of total state output. Sheep were concentrated in the Paroo, Murweh and Quilpie shires, which are predominantly mulga. It is estimated that about two-thirds of total production and value of production in the four shires can be attributed to the mulga region.

The gross values of production of livestock and livestock products for the four shires are also presented in Table 1.1. The values are the average of the three-year period, expressed in 1987-88 dollars using the ABARE Index of Prices Paid. Average gross total value was $127m, mostly in livestock products. The region produced 15% of the State's total gross value of livestock products and 3% of livestock gross value.

Table 1.1. Summary sheep and cattle statistics for the Paroo, Murweh, Quilpie
and Bulloo shires, average of 1985-86, 1986-87 and 1987-88 years

	Paroo	Murweh	Quilpie	Bulloo	Total
Sheep					
Sheep numbers	1 285 108	1 040 317	989 862	287 624	3 602 910
Wool shorn (kg)	5 775 333	4 370 000	4 240 667	1 350 333	15 736 333
Cut per head (kg greasy)	4.49	4.20	4.28	4.69	4.27
Per cent of state	9.10	6.88	6.68	2.13	24.79
Drought loss	69 067	64 644	65 640	19 638	218 989
% loss	5.4	6.2	6.6	6.8	6.1
Cattle					
Cattle numbers	25 189	127 096	52 324	116 330	320 938
Turnoff: Cows	2 382	12 647	3 229	8 248	26 505
Steers	3 341	16 529	11 731	19 295	50 897
Calves	950	5 900	909	1 097	8 856
Drought losses	1 072	4 908	2 509	3 827	12 316
% loss	4.3	3.9	4.8	3.3	3.8
Gross value of production ($'000)					
Livestock	4,777	15,631	7,910	13,135	41,453
Livestock products	31,553	24,030	23,110	7,358	86,051

Source: ABS

2. SAMPLE SURVEY DESIGN AND DATA COLLECTION PROCEDURES

2.1 Population frame and sample selection

Property population lists were obtained for the Paroo, Quilpie, Murweh and Bulloo Shires of western Queensland. The total population of properties in these four shires was 494. Lands Department information on property titles were used to determine property sizes in the region. Holdings that were less than 5000 hectares were not included in the list.

From this list a sub-set was taken of properties whose land area was predominantly mulga country, the criteria being that properties needed to have approximately 80% or greater of land area as mulga. Properties run in conjunction with other properties outside the mulga region were excluded. The number of properties in the sub-set, properties with approximately 80% or greater land area being mulga was 259. When known property amalgamations were taken into account this number was reduced to 234.

The population sub-set of 234 graziers was divided into two regional groups. The first group, referred to as eastern mulga, included properties in the area to the east of the Warrego River and north of Cunnamulla. The second group included all other mulga properties (to the west of the Warrego River and south of Cunnamulla) and was referred to as the western group. The regions are differentiated by their vegetation and soil types and rainfall. Generally, the western region is hard mulga with shallow, gravelly soils and low rainfall. The eastern region is mostly soft mulga and has a higher rainfall, and deeper soils.

The eastern region comprised 64 properties and the west 170 properties.

An initial sample of 60 graziers was selected on the basis of the expected accuracy of sample statistics, and time and cost constraints in data collection. The western group was stratified according to size to ensure more precise sample statistics and to ensure a wide cross-section of property sizes for an analysis of size economies. Property size was chosen as the criterion for stratification as it was thought to be closely related to incomes and was also hypothesised to be correlated with stocking rates.

The selected strata bounds, sample allocations, and survey response rate are detailed in Table 2.1. The initial objective was to completely enumerate the large-property category in the western mulga (group W3).

Table 2.1. Sample allocation, strata bounds and final response rate

Region	Eastern mulga	Western mulga		Total
Western mulga group	W1	W2	W3	
Size strata (ha)	-	5-24 999	25-54 999	>55 000	
No. in population	64	82	71	17	234
No. in original sample	10	14	19	17	60
Final sample	8	12	20	7	47
Response rate (%)	26	41	59	41	43
Sampling fraction[a]	12.5	14.6	28.2	41.2	20

a. Sampling fraction is the stratum sample size divided by stratum population.

The response rate was relatively low with only 43% of graziers contacted able to fulfil the requirements of the survey. A major cause of non-response was inability to provide a complete three years of data, due to changes of ownership. This accounted for 34% of non-respondents. Around 12% of properties were found to be operated in conjunction with properties outside the region.

2.2 Study variables and questionnaire design

In order to reduce variability attributable to climatic conditions or other factors, data were collected over a three-year period from July 1985 to June 1988. The information to be collected by the survey was identified as covering three broad areas. These were financial performance data, land use and production data and socio-economic data.

Financial data were collected from taxation returns, property cash books, account sales and wool returns. The questionnaire was structured to closely approximate the items and headings used in taxation records. Information collected included value of property, capital investment, debt, assets, cash receipts and cash payments.

Land use and production data were obtained from account sales, wool returns, shearing tally books, farm diaries and ABS questionnaires. Information collected included property area, stock numbers, timing of purchases and sales, numbers shorn, wool cut, lamb marking percentage and use of mulga feed.

Socio-economic data were collected by asking the grazier specific questions regarding various aspects of management, including type of business entity, land tenure, ownership intentions, education expenses, attitudes to stocking rates, and major concerns.

A second part of the survey examines the land condition of the properties surveyed. A land condition score was given on the basis of pasture quality, extent of woody weeds and the presence of gully and sheet erosion. The results of the condition survey are contained in a separate report.

Data collection for the financial survey was carried out by officers of the Economic Services Branch. Graziers selected in the sample were contacted by letter. Later they were contacted by telephone to arrange an interview. Duration of interviews ranged from 2 to 4 hours.

Graziers who were ineligible for the survey and those refusing to participate were replaced by graziers from a pre-selected list of reserves.

3. DEFINITION OF FINANCIAL MEASURES

3.1 Introduction

To enable a correct interpretation of the financial segment of the report, a number of summary statistics and measures are defined in this section. The financial and physical measures broadly followed the ABARE approach and were similar to those used in the Queensland Department of Primary Industries' report on the peanut industry.

3.1.1 Physical Items

'Family properties' were defined as establishments owned by an individual operator, a partnership or a family owned company and which utilise at least 48 work-weeks of operator, partner and family labour during the year.

'Total property area' included all land owned and operated by the grazier. It included land leased by the grazier.

'Labour' was measured in work-weeks, based on the operator's or manager's estimate of work time.

'Total labour' included all work on the property supplied by the operator, partners, family and hired casual and permanent labour, but excluding contractors.

'Dry sheep equivalents' were calculated for each property using the following approximate conversions:

Breeding ewes	1.3
Wethers	1.0
Lambs	0.75
Breeding cows	12.0
Steers, dry cows, bulls	8.0
Calves and weaners	6.0

Where the grazier indicated that ewes were run as dry sheep, these were rated as one dry sheep equivalent. When referring to dry sheep equivalents, the abbreviation DSE was used in this report.

3.1.2 Financial Items

All financial data collected in the survey were expressed in 1988 dollars before being averaged. All cash receipts for the 1985-86 and 1986-87 years were indexed forward using the ABARE Index of Prices Paid for Queensland, and all cash payments were indexed forward using the prices paid index closest to the item in question. This procedure ensured that all cash values represented dollars with an equivalent purchasing power.

Capital items (machinery, workshop equipment, fences, buildings, water) were valued using the grazier's estimate of value. Where this was not possible, (as in the case of fences, watering facilities and buildings) details of the age, type and dimensions of the item were obtained and an estimate of value was made using new values as a basis. As no market exists for unimproved land graziers were asked to estimate the bare value of their properties (land and fixed improvements only). The value of unimproved land was calculated by subtracting the estimated value of buildings, fences and watering facilities from the grazier's estimate of the bare value of land. This method was based on the premise that much of a property's value lies in its improvements.

All fixed equipment and machinery were valued at either current second-hand value or new market price and depreciated for age. For each of the three survey years, a value for the items was entered. Annual depreciation rates used were:

Motor vehicles, tractors, aircraft	15.0%
Workshop equipment	7.5%
Computers	15.0%
Livestock equipment	7.5%
Buildings	4.5%
Fences, yards, roads	4.5%
Bores, dams, windmills, tanks	3.0%

Another component of total capital was livestock. Livestock values were obtained by using the average of all purchase and sale prices of sheep and cattle collected in the survey. The values were then expressed in 1988 dollars using the ABARE Index of Prices Paid. The 1988 dollar values for each of the three years for sheep and cattle are detailed in Table 3.1.

Table 3.1. Values used for estimating capital value of livestock

	1985-86	1986-87	1987-88
		$/head	
Sheep	12.82	10.94	17.20
Cattle	278.00	317.00	272.00

The values reflected market changes during the period and demonstrated the impact on livestock capital of the wool price increase in 1987-88. The livestock numbers were multiplied by the average of opening and closing values for each year.

Leased equipment, usually motor vehicles, was included in the list of capital, as leasing was treated as a form of capital acquisition. This treatment differs from the ABARE approach where leased capital is omitted. Leased items were listed separately to enable them to be omitted from the capital list for the estimate of certain financial measures, and for comparison with ABARE results.

The imputed value of family labour was estimated using the Queensland Station Hands' Award. The Federal Pastoral Industry Award does not apply to Queensland. This was another departure from the ABARE method. Operator's labour was valued at the general station hand's rate. Labour supplied by sons and daughters under grade 12 was valued at the second-year Jackeroo/Jillaroo award rate. The award rate for the operator, in 1988 dollars, was $12,831 in 1987-88.

In some cases, graziers were engaged in providing contract services such as shearing, road grading, tree clearing or aerial mustering. Where possible, revenues and costs associated with such activities were excluded. In most cases, this was not possible and such revenues are included in the cash receipts and payments quoted in this report.

3.1.3 Key financial items

'Total cash receipts' represent the cash inflows to the property business during the financial year from the sale of livestock, wool and other livestock products, royalties, rebates and refunds, plant hire, contracts, insurance claims, livestock compensation, government assistance and other revenue from farm operations.

'Total cash payments' include all payments made by the grazier's business for permanent and casual hired labour (excluding operator and family labour), shearing, mustering, materials, services and contracts, rent and crown leases, interest, livestock purchases and other business-related payments. Capital and household expenditures are excluded from total cash costs.

'Cash operating surplus' is the difference between total cash receipts and total cash payments.

'Cash margin' is defined as the farm cash operating surplus, less a living allowance (one head stockman's wage) and an imputed principal repayment (one-eighth of total debt outstanding).

'Depreciation' of property plant and equipment was estimated by the diminishing value method.

'Interest.' The imputed interest cost of capital invested in land, plant, equipment and stock was estimated as 5% of total value. The 5% rate represents a real interest cost.

'Return to capital and management' is defined as the farm cash operating surplus plus lease payments less depreciation and the imputed value of operator, partner and family labour.

'Equity ratio' expresses equity as a proportion of total assets.

'Farm income per work year of family labour' is defined as total cash receipts less total cash costs plus lease payments, less depreciation, divided by the average labour input of operators, partners and family members. It provides an estimate of farm income per work year of family labour.

'Ratios.' For many financial estimates, ratios have been calculated for rates per hectare and per DSE, where DSEs were estimated using combined averaged sheep and cattle numbers.

4. SURVEY RESULTS – FINANCIAL PERFORMANCE

4.1 Land area and production

4.1.1 Property areas

The survey average property areas and their relative standard errors are given in Table 4.1, together with population averages obtained from available records.

Table 4.1. Property areas

	Average for eastern mulga	Western mulga property size groups			Average for western mulga	Average for all properties
		W1	W2	W3		
			ha			
Survey average property areas	20 010 (9.6)	18 527 (5.9)	37 179 (3.9)	121 992 (19.3)	36 670 (6.8)	32 113 (5.9)
Population average property areas	22 197	16 171	36 083	140 704	36 941	32 908

The survey results were generally close to the population averages, with the exception of the western mulga small property size group (W1). The population mean for this group was just under two standard errors from the survey average. The average property area in the sample was 32 100 ha.

4.1.2 Stock numbers and stocking rates

The stock numbers and stocking rates for survey properties are detailed in Table 4.2.

Table 4.2. Stock numbers and stocking rates, average of all properties

	Average for eastern mulga	Western mulga property size groups			Average for western mulga	Average for all properties
		W1	W2	W3		
			ha			
Sheep numbers (DSEs)	5 348	5 266	8 890	14 926	7 747 (6.4)	7 091 (6.3)
Cattle numbers (DSEs)	2 821	1 883	2 377	12 457	3 147 (16.5)	3 058 (14.9)
Total DSEs	8 170 (11)	7 149 (9.7)	11 267 (5.5)	27 383 (16.3)	10 893 (5.6)	10 149 (5)
Sheep % of total	68	78	79	57	76 (4.6)	74 (5.0)
Ha/DSE	2.70 (12.2)	2.92 (9.3)	3.49 (4.6)	4.95 (16.3)	3.36 (5.0)	3.18 (4.8)

The data showed consistently that stocking rates were higher on smaller properties, and tended to be higher on eastern mulga properties than on western mulga properties. The difference between east and west was significant at the 5% level, as was the difference in stocking rates between W2 and W3 properties. Another feature was that the proportion of cattle in total DSEs was higher in the eastern mulga and was significantly higher in the western W3 group. The largest properties tended to stock a larger proportion of cattle. The reasons for this are not known, but may be due to easier mustering, labour costs or suitability of the country. The higher proportion of cattle in the eastern mulga (32% compared to 24% in the west) may be due to regional differences and suitability of vegetation. This difference was not significant at the 5% level.

On western mulga properties with areas between 5000 and 55 000 ha, about 80% of total DSEs stocked were sheep. The proportion of cattle in total DSEs was greatest on the large category properties, at 43%. The stocking of cattle by wool-growers is often due to the belief that a small number of cattle do not affect stocking rates due to their different grazing habits. Another reason is purely for diversification, to reduce the risk of relying on only one product. On average, around 26% of total dry sheep equivalents in the mulga were cattle.

The average stocking rate in the mulga during the survey period was one dry sheep equivalent to 3.18 ha (around 8 acres). In the western mulga the average was slightly lower, at one dry sheep equivalent to 3.36 ha. Stocking rates were lowest on the larger properties in the western mulga with only one sheep to almost 5 ha, and highest in the eastern mulga with one sheep to 2.7 ha.

4.1.3   Wool production and sheep population data

In Table 4.3 data are presented for wool cuts per head and various measures of sheep numbers.

Table 4.3.   Wool production and breakdown of sheep numbers by type, mulga properties with sheep

	Average for eastern mulga	Western mulga property size groups			Average for western mulga	Average for all properties
		W1	W2	W3		
			ha			
Cut per head (kg)	4.26 (15.8)	4.54 (3.2)	4.47 (5.5)	4.92 (12)	4.55 (3.0)	4.47 (4.7)
Ewe numbers (DSEs)	997	2085	3717	6538	3212 (10.6)	2606 (10.4)
Wether numbers (DSEs)	4861	2686	4883	7010	4037 (8.7)	4262 (8.0)
Lambing %	43.3	50.8	59.1	47.5	53.9 (7.8)	51.0 (7.8)

Note: Lambing percentages are the average for properties with ewes.

Cuts per head given in the table are the average of wool producing properties and of wool producing years. Where data were not available for wool production in any particular year or for a property, the observations were omitted. The average cut per head was 4.47 kg, slightly higher than the ABS average of 4.27 kg for the four mulga shires over the same period. Cuts per head were highest among western mulga properties, with the large properties (group W3) showing the highest average of 4.92 kg. This result may be due to the lower stocking rate observed for these properties. Similarly, the lowest cut per head (4.6 kg) for the eastern mulga graziers reflected the higher stocking rates of this group.

The data showed that the average mulga sheep or mixed-stock property carried 4260 DSEs as wethers and 2600 DSEs as ewes. Eastern mulga properties carried proportionally fewer ewes, while the larger western mulga properties stocked the highest proportion of breeding stock. In terms of total DSEs for all properties, ewes and wethers comprised 25% and 40% respectively.

4.2 Capital investment and farm business debt

A summary of the survey results for capital investment per property is presented in Table 4.4. The average total capital value was estimated at $960,000, and ranged from $736,000 for the small western mulga size group to $2.49m for the large size group.

After land, which consisted of around 53% of total capital regardless of property size or region, the largest capital item was livestock. Livestock consisted of over 17% of the total investment on the average mulga property, ranging from 16% for the smaller western mulga properties (W1) to over 20% for the largest properties (W3).

Details of total business investment, debt and equity ratios at 30-6-88 are also given in Table 4.4.

Table 4.4.   Total capital investment, debt and equity at 30-6-88

	Eastern mulga	W1	W2	W3	Western mulga	Total
Average total capital investment ($)	743,100 (10.8)	736,281 (9.7)	1,056,525 (6)	2,488,780 (9.1)	1,045,393 (4.7)	962,715 (4.3)
			1987-88			
Total capital investment ($)	760,129	731,789	1,082,859	2,523,875	1,057,745 (4.6)	976,347 (4.2)
Farm business debt ($)	160,945	94,861	152,233	286,142	137,971 (12.0)	144,254 (11.4)
Farm business equity ($)	599,184	636,928	930,626	2,237,733	919,774 (4.8)	832,093 (4.4)
Equity ratio (%)	79 (5.0)	86 (3)	86 (2.2)	90 (3)	87 (1.7)	85 (1.8)
Debt/ha ($)	8.74 (14)	6.44 (18)	4.20 (13)	2.75 (32)	5.14 (11.9)	6.12 (9.1)
Debt/DSE ($)	22.83 (15.8)	17.93 (16.4)	14.11 (12.8)	10.21 (22)	15.56 (10.4)	17.55 (8.8)

Regional differences in equity ratios between eastern and western mulga properties were significant at the 5% level in 1987-88. The low average equity ratios of eastern mulga properties may be related to the small property sizes or slightly higher land values in the region.

Between 1985-86 and 1987-88, the average equity position of all mulga properties established for four years or more grew from 80% to 85%. This development would likely be a result of sharply improved wool prices, which allowed graziers to reduce debt levels and boosted their total capital assets by raising the value of livestock.

4.3 Financial summary data

4.3.1 Cash receipts and cash payments

A summary of average total cash receipts per property is given in Table 4.5. Wool was by far the major source of income, with around 77% of total receipts. Beef cattle income formed a larger percentage of receipts in the eastern mulga with 19% compared to 13.5% in the western mulga.

Cash payments per property are detailed in Table 4.6. Labour costs are the largest single item with 18.5% of total outlays. Combined materials (fuel, repairs and livestock materials) comprised almost 20%. Service costs including rates, marketing and freight made up 29%, and the remainder (33%) consisted of interest payments, livestock purchases and rents.

Total cash costs averaged around $5.50 per hectare, ranging from $3 per hectare on the western mulga large group properties to $7 per hectare on eastern mulga properties.

4.3.2 Non-cash costs

Non-cash costs include depreciation, imputed interest on capital and operator and family labour.

Depreciation costs were estimated on the basis of information collected on property plant and equipment. The average depreciation cost was $21,000 as shown in Table 4.7.

Estimated operator and family labour costs for mulga properties averaged $19,000. As expected, there was little variation in family labour costs according to property size.

Imputed interest represents the income foregone on total capital invested on the mulga property. The average imputed interest cost was slightly over $48,000, representing 5% of total average capital invested.

Figure 4.1 contains pie-chart diagrams showing the break-up of costs for mulga properties. The charts include non-cash costs of depreciation, family labour and interest, and cash costs of materials, labour services and livestock. Actual interest costs and lease payments were subtracted from cash costs for the purpose of these charts.

4.3.3 Farm cash operating surplus

The average farm cash operating surplus is given in Table 4.8. This figure
represents the difference between cash costs and cash receipts, and includes
interest paid and lease payments.

The average cash surplus was $51,245 for mulga properties, ranging from
$23,181 for eastern mulga properties to $108,322 for the large (W3) western
mulga properties. Cash surplus was $1.89/ha or $4.86/DSE for average mulga
properties.

Table 4.5. Average total cash receipts per property

	Eastern mulga	W1	W2	W3	Western mulga	Total
			$			
Sheep	19,180 (51)	9,768	17,229	17,773	12,015 (13)	13,974 (21)
Cattle	32,169 (35)	14,330	19,376	79,390	22,945 (16.8)	25,468 (16.4)
Other livestock	0 –	41	218	28	114 (62)	83 (62)
Livestock products	108,053 (18.5)	120,121 (12.5)	187,387 (8.2)	322,024 (27.0)	168,429 (7.7)	151,916 (7.2)
Sundry receipts	6,289 (22.8)	6,143	4,825	10,655	6,043 (18.2)	6,110 (14.6)
Total cash receipts	165,691 (17.8)	150,404 (9.7)	225,035 (6.0)	429,870 (23.5)	209,546 (6.5)	197,552 (6.5)

$/ha

$/DSE ·

Table 4.6.   Summary of average cash payments per property

	Eastern mulga	W1	W2	W3	Western mulga	Total
			$			
Total labour	15,834	21,102	32,127	80,415	31,642	27,318
Fuel & oil	4,714	5,446	7,483	9,544	6,707	6,162
Repairs & maintenance	8,363	13,291	15,563	43,128	17,224	14,801
Livestock materials	4,918	3,853	3,873	9,591	4,435	4,567
Other	3,034	2,328	3,661	4,398	3,093	3,076
Total materials	21,029	24,918	30,580	66,661	31,459	28,606
Admin. costs	5,551	4,120	4,623	11,116	5,030	5,173
Freight	6,159	3,392	5,912	8,511	4,957	5,286
Marketing	12,795	14,566	23,279	32,437	19,995	18,026
Rates & taxes	2,484	2,763	3,817	20,219	4,949	4,275
Other services & contracts	6,488	8,482	9,821	29,218	11,116	9,849
Total services	33,477	33,323	47,452	101,501	46,047	42,609
Livestock purchases	51,816	15,076	17,530	31,973	17,791	27,097
Interest paid	19,895	12,834	22,264	36,135	19,106	19,321
Land rent	459	858	1,893	4,863	1,691	1,354
Total other payments	72,170	28,767	41,687	72,972	38,588	47,773
Total cash payments	142,510	108,110	151,846	321,549	147,736	146,306
Total cash payments per hectare	7.01	6.04	4.14	3.02	4.96	5.51

X2·7

$ 19/0S€·

X 4·95

$ 15/DS€

BREAKDOWN OF TOTAL COSTS

Percentage of total costs for eastern, western and all mulga properties

Eastern mulga

Materials (10.7)
Labour (5)
Interest (18.5)
Services (17)
Family labour (10.6)
Depreciation (8.7)
Livestock (29.3)

All mulga properties

Labour (12.9)
Materials (13.5)
Interest (22.7)
Services (19.2)
Family labour (8.9)
Depreciation (9.9)
Livestock (12.8)

Western mulga

Hired labour (14.7)
Materials (14.8)
Interest (24.3)
Services (20.2)
Family labour (8.4)
Depreciation (9.6)
Livestock (8.3)

Figure 4.1

Table 4.7. Key financial summary data: average per property

	Eastern mulga	W1	W2	W3	Western mulga	Total
			$			
Total cash receipts	165,691	150,404	225,035	429,870	209,546	197,552
	(17.8)	(9.7)	(6.0)	(23.5)	(6.5)	(6.5)
Total cash costs	142,510	108,110	151,846	321,549	147,736	146,306
	(19.8)	(6.6)	(7.1)	(16.5)	(5.3)	(6.5)
Farm cash operating surplus	23,181	42,293	73,188	108,322	61,810	51,245
	(41.9)	(21.9)	(10.4)	(59.8)	(13.7)	(13.1)
Depreciation	17,085	16,697	22,258	51,187	22,471	20,998
	(23.2)	(5.6)	(8.2)	(6.0)	(4.2)	(6.1)
Operator & family labour	20,925	17,169	18,522	21,076	18,125	18,891
	(14.2)	(8.1)	(5.1)	(22.6)	(5.0)	(5.5)
Return to capital & management	-14,829	10,108	35,584	41,186	23,865	13,283
	(70.4)	(96.1)	(22.5)	(149.6)	(35.3)	(50.9)
Return adjusted to full equity	5,525	23,800	59,742	82,184	44,662	33,958
	(141)	(42)	(13.2)	(75.3)	(19)	(19.2)
Rate of return to capital & management (%)	-1.32	2.6	5.72	3.43	3.99	3.26
	(91)	(57)	(15)	(55)	(20.5)	(20.8)
Cash margin	-12,760	15,303	40,106	61,313	30,272	18,502
	(99)	(64)	(22)	(116)	(30.8)	(41.2)
Income per work year of family labour	4,408	23,112	40,271	54,645	33,437	25,498
	(126)	(31.4)	(15.8)	(29.4)	(14)	(14.6)

4.3.4 · Return to capital and management

The return to capital and management is simply the farm cash operating surplus less depreciation and family labour costs. Lease payments were added to avoid double counting.

Eastern mulga graziers earned a negative return to capital and management.   The average for all mulga graziers was $13,300, $0.47/DSE and $0.35/ha.   The results showed a significant difference between eastern and western mulga graziers.

4.3.5 Return adjusted to full equity

The return adjusted to full equity represents a return assuming no debts associated with the business, or a return on the resources employed in the business.   It was calculated by adding back interest paid and rent to the return to capital and management.
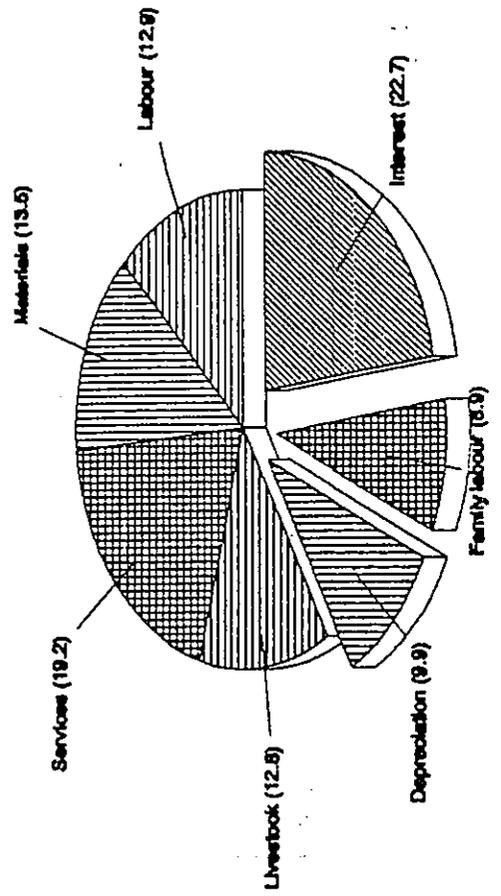
The average return on full equity was $34,000, equivalent to $1.13/ha and $2.66/DSE. A substantial difference, although not statistically significant, existed between eastern and western mulga graziers ($5,500 compared with $44,700). The strong performance of the medium (W2) western mulga properties was noteworthy. These graziers achieved a strong cash operating surplus, especially on a DSE basis, and this was matched with relatively low depreciation costs compared with the large (W3) western mulga properties.

4.3.6   Cash margin

The cash margin was net of an imputed principal repayment estimate and the cost of one family labour unit. The cash margin averaged $18,500 for mulga graziers, and again, significant differences were found between eastern and western mulga graziers. The average cash margin was $0.56/ha and $1.02/DSE.

4.3.7   Income per work year of family labour

Income, when expressed in terms of dollars per work-year of family labour, averaged $25,500 on mulga properties. Incomes were significantly lower on eastern mulga properties, at $4,400 per work-year.

These estimates can be interpreted as the residual income from which the operator and family labour would receive a 'salary'. They can be compared with estimated family labour costs or salaries received by operators of other businesses.

4.3.8   Rate of return

The rate of return was derived by expressing the rate of return to capital and management adjusted to full equity as a percentage of total capital. The rate can be compared with returns from other forms of investment.

The average rate of return was 3.3%. The medium (W2) size western mulga properties achieved the highest rate of return of 5.7%, whilst the eastern graziers achieved the lowest rate of return, at 1.3%.

4.4   Analysis of financial performance

4.4.1   Comparison with ABARE survey results

Table 3.8 contains a comparison of the survey results with those of the ABARE survey of the sheep and sheep-beef industries in Queensland.

The most notable variations were in operator and family labour costs, total farm capital and total farm debt. The difference in operator/family labour may be partly due to the slightly different methods used in valuing labour. The mulga survey used state awards for station hands while the ABARE survey used the Federal Pastoral Industry Award.

Further variations may be due to the more regional focus of the mulga survey compared with the ABARE survey which included graziers across the entire state. The average property size in the mulga survey was 32 000 ha, compared with 16 400 ha for the ABARE sheep industry group and 23 000 ha for the ABARE sheep-beef group.

Despite reservations about the comparison, it appears that mulga graziers under-performed the state average for the grazing industry. The cash surplus and financial return measures were all lower for mulga properties and the level of debt as a proportion of equity was higher. The mulga survey results were closest to the ABARE sheep-only results.

Table 4.8. Comparison of mulga survey results with ABARE survey estimates (1985-88)

Item	Mulga survey	ABARE survey (Qld)	
		Sheep	Sheep-beef
		$	
Total cash receipts	197,552	189,405	236,250
Total cash costs	146,306	120,544	153,502
Farm cash operating surplus	51,245	68,861	82,748
Depreciation	20,998	16,376	20,246
Operator & family labour	18,891	25,202	23,699
Return to capital & management	13,283	27,976	39,421
Return adjusted to full equity	33,958	38,091	55,740
Income per work year of ·family labour	25,498	27,784	32,814
Rate of return to capital & management (%)	3.26	5.5	4.4
Farm capital	962,715	693,656	1,272,280
Farm business debt	158,764	80,750	120,369
Equity ratio (%)	82	88	91

Note: ABARE survey results given in the table are average of the three financial years expressed in 1987-88 dollars. The 1987-88 ABARE data were provisional estimates.

4.4.2 Distribution of properties by financial performance

The distribution of mulga properties by return to capital and management at full equity is given in Table 4.9. The data indicate that 23% of graziers achieved a negative average return over the three years. A further 28% of graziers achieved a return of between 0 and $40,000. The distribution of graziers was evenly spread across the range, with around 19% of graziers realising a return of more than $80,000.

Table 4.9. Distribution of properties by return to capital and management at full equity (average of 1985-88 years)

Return at full equity (range)	%
Less than -$20,000	8.5
-$20,000 to $0	14.9
0 to $19,999	6.4
$20,000 to $39,999	21.3
$40,000 to $59,999	14.9
$60,000 to $79,999	14.9
$80,000 to $99,999	2.1
More than $100,000	17.0

4.4.3 Properties 'at risk'

The ABARE assesses a property as being at risk if both the following criteria are met:

. a negative cash margin for the previous 12 months;

. an equity ratio of less than 70%.

Only 2% of survey properties were at risk in 1987—88. A contributing factor to this low level was the buoyant wool market of recent years. In the previous two years, 12.2% of properties were at risk.

Over the three—year period, the percentage of graziers realising negative cash margins declined from 66% to 13%. Graziers were also able to improve their equity positions, with the proportion of properties below 70% equity declining from 15% to 8.5%. Over the period, the average equity ratio rose from 80% in 1985—86 to 85% in 1987—88.

To conclude, the survey results indicated that the wool price improvement enabled many graziers to move out of the 'at risk' category. However, the sample bias inherent in the survey would affect this finding. New graziers may be in the 'at risk' group but were excluded from the survey as three successive years of records were required.

4.4.4 Minimum flock sizes

The economic data were used to assess minimum property sizes and minimum flock sizes.

Regressions were used to relate financial measures (farm cash operating surplus and return to capital and management) to total flock size and total property area. The equations were then used to generate financial performance measures for a range of property sizes and flock sizes. The analysis was performed first for all mulga properties and secondly, for western mulga properties only. Table 4.10 compares performance with total stock numbers.

Table 4.10.   Farm cash operating surplus and return to capital and management
               by flock size

	All mulga		Western mulga	
DSEs	Farm cash operating surplus	Return on capital	Farm cash operating surplus	Return on capital
2 000	-13,136	-37,617	-8,430	-32,614
3 000	- 4,365	-30,534	246	-25,591
4 000	4,406	-23,451	8,921	-18,567
5 000	13,177	-16,367	17,596	-11,544
6 000	21,948	- 9,284	26,271	- 4,520
7 000	30,719	- 2,201	34,946	2,503
8 000	39,490	4,883	43,621	9,526
9 000	48,261	11,966	52,296	16,550
10 000	57,032	19,049	60,971	23,573

A desirable farm cash operating surplus would be at a level which would cover living expenses and depreciation, while the return to capital and management, which includes these costs, should be at least positive. A desirable surplus is considered to be around $40,000.

Based on the results, a flock size of around 7500 DSEs would be a minimum 'living area'. The required size in the western mulga is slightly smaller, with a flock size of around 7000 DSEs being the minimum.

Some qualifications apply to these results. Firstly, they are based on average returns for the three years 1985-86, 1986-87 and 1987-88 and take no account of future changes in profitability. There may also be some variation around the preferred minimum, due to management and regional differences.

A matrix of expected farm cash operating surpluses for various flock sizes and debt sizes was compiled and is presented in Table 4.11. As an example, a debt of $100,000 on a property carrying 8000 DSEs would allow a farm cash operating surplus of $48,000 to be realised.

Table 4.11. Flock size matrix

				Debt ($)				
Flock (DSE)	0	50,000	100,000	200,000	300,000	400,000	500,000	600,000
1 000	1,288	-8,861	-19,011	-39,310	-59,609	-79,908	-100,207	-120,506
2 000	10,928	778	-9,371	-29,670	-49,969	-70,268	-90,567	-110,866
3 000	20,568	10,418	269	-20,030	-40,329	-60,628	-80,927	-101,226
4 000	30,208	20,058	9,909	-10,390	-30,689	-50,988	-71,287	-91,586
5 000	39,847	29,698	19,549	-750	-21,049	-41,348	-61,647	-81,946
6 000	49,487	39,338	29,188	8,889	-11,410	-31,708	-52,007	-72,306
7 000	59,127	48,978	38,828	18,529	-1,770	-22,069	-42,368	-62,667
8 000	68,767	58,618	48,468	28,169	7,870	-12,429	-32,728	-53,027
9 000	78,407	68,257	58,108	37,809	17,510	-2,789	-23,088	-43,387
10 000	88,047	77,897	67,748	47,449	27,150	6,851	-13,448	-33,747
11 000	97,687	87,537	77,388	57,089	36,790	16,491	-3,808	-24,107
12 000	107,326	97,177	87,027	66,729	46,430	26,131	5,832	-14,467
13 000	116,966	106,817	96,667	76,368	56,069	35,770	15,472	-4,827
14 000	126,606	116,457	106,307	86,008	65,709	45,410	25,111	4,812
15 000	136,246	126,097	115,947	95,648	75,349	55,050	34,751	14,452
16 000	145,886	135,736	125,587	105,288	84,989	64,690	44,391	24,092
17 000	155,526	145,376	135,227	114,928	94,629	74,330	54,031	33,732
18 000	165,166	155,016	144,867	124,568	104,269	83,970	63,671	43,372
19 000	174,805	164,656	154,506	134,207	113,909	93,610	73,311	53,012
20 000	184,445	174,296	164,146	143,847	123,548	103,249	82,950	62,651

5.   STOCKING RATES, PRODUCTION AND LAND DEGRADATION

5.1 Introduction

There is increasing concern regarding the productive potential of the mulga country due to the growing body of evidence suggesting long term land degradation in the area.

Evidence of land degradation was presented in research by Mills (1986), Mills et al (1989), and a Western Graziers Association (WGA) report (1989).

The study by Mills et al (1989) included a survey of 70 grazing properties in the mulga lands within the block bounded by Charleville-Quilpie-Thargomindah and Cunnamulla. The survey showed that 44% of the area was affected by woody shrubs and that the potential for woody weed problems existed on a further 21% of total area. Virtually all properties surveyed (68 from 70) contained land in one of these categories.

Another finding was that 64% of the total area was predisposed to erosion and reduced infiltration, as evidenced by excessive areas of bare ground. However, substantial erosion problems were found on only 9% of the total area. In line with these findings, some 62% of the area carried a low perennial grass cover, and 80% recorded pasture biomass levels of less than 100 kg/ha.

The findings of this survey briefly summarised here reveal the main elements of land degradation and resulting low productivity in the region. High pasture use for grazing combined with a series of dry seasons has reduced the cover of grasses which normally dominated woody shrubs.

In the absence of competition, woody shrubs have proliferated, and bare areas of land have increased. With grasses removed, sheet erosion by wind and rain reduced the vital nutrient top soil and inhibited grass-seed germination and water infiltration. The evidence of this has been greater run-off and more frequent stream flows despite a relatively constant rainfall pattern. (WGA 1989). Gully erosion is further evidence of greater run-off.

According to WGA (1989) the critical factors leading to degradation are:

. high grazing pressure during drought and the immediate post-drought period;

. over-use of top feed (mulga);

. absence of fire;

. population growth of kangaroos as a result of improved water supply; and

. properties too small to encourage sound management.

The features of land degradation are more fully expounded in reports by Mills (1989) and WGA (1989).

A major objective of the study was to identify the factors influencing stocking rates and the impact if any, of stocking rates on land degradation. It was hypothesised that factors such as property size, debt commitments, planning horizon, education costs and availability of mulga feed would influence stocking rate decisions. The survey questionnaire was designed to collect information to test these hypotheses. Graziers were asked to provide details of their education costs, the length of period of ownership and intentions for the future. The extent of mulga feeding measured in months for the three year period 1985-1988 was also collected.

In addition to questions regarding specific issues, graziers were asked to put their view on the preferred stocking rates in a non drought year for their properties, and to state how their average stocking rates compared with their preferred rate. Graziers were also asked to identify problems and to expound ideas known on ways to overcome or prevent land degradation.

In this section, the results of this analysis are presented. Simple statistical methods were used to test the hypotheses regarding those factors affecting stocking rates, and a summary is given of graziers' opinions regarding stocking rates and other problems.

5.2 Land degradation and stocking rates

The extent of land degradation on each property was evaluated by means of a land condition survey. For each property, 2000 points were randomly selected and the nature of ground cover at each point was recorded. The seven categories were: bare land, eroded land, litter, perennial grasses, woody weeds mulga and forbs (ephemeral grasses).

While bare areas may indicate sheet erosion, they might also reflect the differing land systems present on properties of different sizes. In the western mulga large property groups, around 58% of the 2000 survey points were bare, compared with 42% on the small property group.

There was little difference between property sizes in the percentage of mulga, forbs and litter. Smaller western mulga properties tended to have a greater proportion of both grasses and woody weeds than the larger properties. Eastern mulga properties had a higher percentage of mulga and the lowest level of woody weeds.

Given the problem of isolating land type effects from degraded land, a degradation measure had to be devised. The resulting measure was bare land (with or without forbs) less areas of residuals, clay-pans and sand-dunes. This measure was a more accurate estimate of the potentially degraded land in the productive land types such as hard and soft mulga, mulga sandplains, alluvials and woodlands.

It was found that this measure of degradation tended to be higher on properties with high stocking rates. This result confirmed the linkage between stocking rates and land degradation. A summary of results is presented in Table 5.1 and contains average stocking rates on properties within each range of potential degradation. The average percentage of degraded land was 35%, and ranged from 0% to 66%.

Table 5.1. Stocking rates by extent of potential land degradation

% of property potentially degraded	Stocking rate (ha/DSE)
<20	5.11
20-29	2.99
30-39	3.47
40-49	2.93
>50	2.75

Note: % potentially degraded land measured as bare land less residuals.

5.3 Factors related to stocking rates

Over time, stocking rates are likely to be influenced by rainfall, wool prices, beef prices and various other external factors including interest rates. At any point in time factors which could be expected to influence stocking decisions on individual properties might include property size, debt levels, grazier's planning horizon and ownership intentions, and other demands on property finances. The extent of mulga feeding was also thought to influence stocking rates. The survey data were analysed to determine if any correlation existed between stocking rates and these factors.

The initial analysis indicated that property size, debt per hectare and the extent of mulga feeding were the only variables closely linked to stocking rates. The remaining variables did not appear to be significant for the average property, but were thought to be relevant at the extreme cases. For example, properties with excessive education costs were expected to be more heavily stocked.

Each of the possible factors is discussed in further detail below.

5.3.1 Property size

The results of the analysis indicated that as the property size increased, the stocking rate measured as ha/DSE also increased, that is, stocking pressure became lighter. This link between stocking rates and property size was also evident in the financial analysis which showed lower average stocking rates on larger properties.

In Table 5.2, the average stocking rates for different property size groups are presented. The table clearly shows the lighter stocking rates on larger properties. This result may be explained by the poorer land types on larger properties, and some evidence of this is seen in Table 5.2, as the proportion of residuals and hard mulga also increases.

Table 5.2. Stocking rates for different property sizes

Property size (ha)	Stocking rate (ha/DSE)	% Residuals and hard mulga
Less than 20 000	2.67	24
20 000 to 29 999	2.90	42
30 000 to 39 999	3.45	54
over 40 000	4.08	44

For this reason, a comparison was made between stocking rates and the area of soft mulga or productive land on each property. The results showed that as the area of the best quality land increased, stocking rates declined, as shown in Table 5.3.

The conclusion drawn from this is that larger properties can more easily achieve the minimum number of stock required for a living income. These properties have a greater number of management options than smaller properties.

Table 5.3. Stocking rates by the area of productive land on each property

Area (ha)	Stocking rate (ha/DSE)
less than 10 000	2.73
10 000 to 19 999	2.85
20 000 to 29 999	3.41
over 30 000	4.36

5.3.2 Debt commitments

It was expected that stocking rates would be higher on those properties with larger debt. The analysis confirmed this expectation, as shown in Table 5.4. Debt was measured on a per hectare basis.

Table 5.4. Stocking rate by different debt levels

Debt level ($'000/ha)	Stocking rate (ha/DSE)
<1	4.35
1 to 3.9	3.21
4 to 6.9	3.40
over 7	2.60

5.3.3   Education costs

The high cost of education for graziers' children was considered a possible factor in stocking decisions following comments by grazier associations and individual graziers. Not only are graziers confronted with boarding school fees, but also travel and incidental costs. In the survey graziers were asked to provide estimates of education costs, the type of expense incurred and the number of children involved.

An initial regression analysis indicated that education costs were not significant in explaining stocking rates. An additional analysis divided graziers into two groups: graziers with over $10,000 in education expenses and those with under $10,000 in expenses. The results showed that stocking rates were significantly lower for those with less than $10,000 in education expenses (3.47 ha/DSE compared with 2.7 ha/DSE).

5.3.4   Property ownership and intentions

It was hypothesised that the grazier's planning horizon may influence stocking decisions. For example, if a grazier intended to sell within a few years, he may increase stocking rates to maximise short-term income. Conversely, if a grazier was planning to pass the property to the next generation of his family, his stocking rates may be conservative.

Reliable data on the planning horizon were not available. However, graziers were able to provide information on intentions regarding future ownership. Over half of the graziers interviewed intended to pass the property on to their offspring, and 20% of graziers intended to sell before their retirement. The remaining 27% of graziers were uncertain.

There was no significant difference between stocking rates of those graziers intending to sell and those intending to pass the property to the next generation. The data collected in the survey do not support the hypothesis that stocking rates on the average mulga property are influenced by ownership intentions.

5.3.5 Mulga feeding

It was expected that stocking rate would be influenced by the extent of mulga feeding. Smaller properties could be expected to maintain stocking rates by using mulga top-feed.

The data indicated that properties with a high use of mulga (in the last 10 years) were found to have lower average stocking rates. It is possible that these properties are either severely degraded or drought affected.

5.4 Effect of stocking rate, property size and land degradation on profitability

Profitability was measured as the farm cash operating surplus (FCOS), simply the difference between cash receipts and cash payments. Costs such as interest, livestock purchases and lease payments were included in total costs.

Physical factors affecting the FCOS were expected to be property size, stocking rate, land condition and region, mulga feeding and proportion of sheep. In Table 5.5, the FCOS, FCOS/ha and FCOS/DSE are compared for different stocking rate levels.

Table 5.5. Farm cash operating surplus by stocking rate

Stocking rate	FCOS	FCOS/ha	FCOS/DSE
ha/DSE	$	$	$
< 2.5	58,644	2.97	5.96
2.5 - 4.0	75,056	1.66	5.24
> 4.0	67,504	1.37	5.99

Total FCOS showed no variation over the range of stocking rates. On a per hectare basis, FCOS declined as stocking rates became lighter. This is to be expected, although land type may be the main reason for lighter stocking rates.

There was no indication that FCOS/DSE improved with lower stocking rates.

A similar comparison between profitability measures and land condition is given in Table 5.6.

Table 5.6. Farm cash operating surplus (FCOS) by land condition (% of bare land and forbs less residuals)

% potentially degraded	FCOS	FCOS/ha	FCOS/DSE
	$	$	$
< 40	55,331	1.20	4.37
40 - 60	67,649	2.51	6.54
> 60	79,440	1.73	5.40

The results in Table 5.6 indicate that farm cash operating surplus increases with the level of potential degradation. These results could be interpreted as meaning that degradation resulting from high stocking rates has not affected property incomes. The FCOS/ha showed a similar pattern, while no significant differences were found between FCOS/DSE for different levels of potential degradation.

5.6 Graziers' concerns

Each grazier was asked to state their perception of the main concerns for the future of grazing in the mulga. The question was open to any answer and involved no prompting. A list of the main concerns is presented in Table 5.8, ranked according to the number of times raised.

By far the biggest single concern was woody weeds, noted by half of the graziers interviewed. Many graziers attributed the increase in woody weeds to the absence of summer rain and changing rainfall patterns, a problem nominated by ten graziers. The increased distribution of rain in winter months favoured woody weeds and the absence of grasses enabled the weeds to flourish.

Rising general costs concerned ten graziers or around 20% of the sample. Other graziers nominated specific cost areas, including interest rates (7), labour (5), fuel, energy and transport (2), education (1), living costs (1) and mustering (1).

The next biggest problem was competition for pasture from kangaroos. Graziers indicated that stocking rate differentials between paddocks tended to be reduced by native animals. Thus, kangaroos can reduce the benefits of paddock spelling. As indicated in Section 4.4, some graziers stocked at higher than preferred rates because of kangaroo competition.

Table 5.8. A list of graziers' concerns for the future

	Problem	Number of mentions
1.	Woody weeds	24
2.	Absence of summer rain/change in climate pattern	10
3.	Rising general costs	10
4.	Competition from kangaroos	9
5.	Gully and sheet erosion	8
6.	Property sizes too small	8
7.	High interest rates	7
8.	Mulga regrowth	6
9.	Drought	5
10.	Overseas markets unreliable	5
11.	Shortages and cost of skilled labour	5

Gully and sheet erosion was noted as a problem by eight graziers, or 17% of the sample. A similar number identified small property sizes as a problem. Seven graziers complained of high interest rates, a result which may reflect the timing of the survey.

5.5 Graziers' views on stocking rates

Survey graziers were asked their preferred stocking rate and an estimate of their actual stocking rate. Where the actual rate exceeded the preferred, graziers were asked to give reasons.

The results indicated that 21 graziers or 45% of those interviewed were stocking heavier than their preferred rate. Graziers' reasons for heavier stocking are detailed in Table 5.7.

Table 5.7. Graziers' reasons for stocking at higher than preferred rates

Reason	Number of responses
Property too small to support living expenses	8
Property too small to meet debt repayments	8
Property is large enough, but have to stock heavily to meet living expenses	1
Property is large enough, but have to stock heavily to meet debt repayments	8
Kangaroos' competition	2
Use of mulga to supplement feed	2

These results indicated that debt was a significant factor for stocking decisions, and that small property size was a major reason for stocking at a heavier than preferred rate. Of those nominating property size as the major reason, half referred to debt repayments as the financial constraint, and half referred to living expenses. Seventeen per cent of interviewed graziers stated that their properties were large enough, but that debt repayments were forcing them to stock at a higher than preferred rate. Other graziers referred to kangaroo competition for pasture as a reason, while others stated that mulga feeding enabled them to stock at a higher rate.

While 21 graziers stated that they were carrying more stock than preferred, a further 13 graziers were found to be stocking at levels lower or equal to their preferred rate. The remaining 13 graziers thought they were stocking at lower than preferred rates but were in fact stocking higher.

In summary, almost half (45%) of graziers knew they were stocking at heavier than preferred rates and were able to give reasons. Only 27% were stocking within their own guidelines.

A frequency distribution of average stocking rates is illustrated in Figure 5.1.

The chart shows the range in stocking rates of the surveyed graziers and the number of graziers falling within each range. Almost half of the graziers stocked heavier than 3 ha/DSE.

In summary, almost half (45%) of graziers knew they were stocking at heavier than preferred rates and were able to give reasons. Only 27% were stocking at rates within their own guidelines.

A frequency distribution of average stocking rates is illustrated in Figure 5.1.
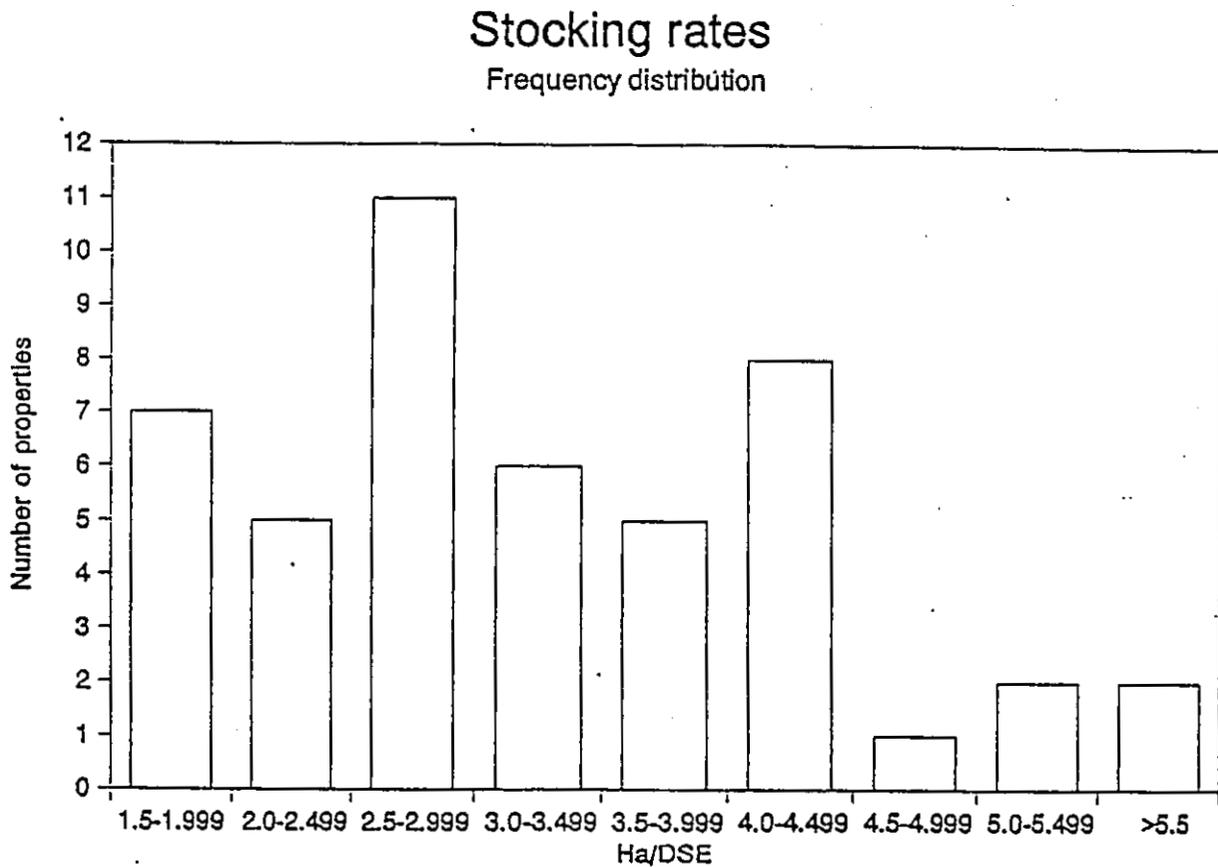
Stocking rates
Frequency distribution

Figure 5.1. Frequency distribution of average stocking rates