COMMONWEALTH OF AUSTRALIA

The Australian Sheep Industry Survey

1954

Queensland

&

BUREAU OF AGRICULTURAL ECONOMICS
CANBERRA, A.C.T.
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FOREWORD

*The Bureau of Agricultural Economics has in recent years made several economic surveys within the sheep industry. These each investigated some particular district, some particular type of sheep enterprise, or some specific problem such as the economics of drought feeding; none was a general survey of the entire industry. However, graziers' and farmers' organizations have for some time been advocating such a survey and in mid-*1954 *the Committee for Wool Research approved plans for a survey which would cover the industry throughout Australia.*

Accordingly, the B.A.E. initiated the survey in Queensland in June 1954 *and completed the field work in South Australia in April* 1955.

The principal aims of the survey were:

1. *To discover the relationships between costs and returns, the structure of costs, the returns to capital and management, and the capital structure of the industry in each of Australia's three main sheep zones; the pastoral zone, the wheat-sheep zone and the zone of high rainfall.*
2. *To discover within each of the three zones the inter-State and inter-regional differences in the financial structure of the industry.*
3. *To compare the financial structure and performance of sheep enterprises of diverse sizes and with sundry associated enterprises (e.g. wheat or cattle or orchards).*
4. *To trace the effect upon financial performance of various practices in management and in sheep husbandry.*
5. *To discern general trends in the industry (e.g. any widespread and increasing preference for crossbreds to pure merinos).*
6. *To examine the industry's capacity for expansion and any circumstance which might restrict it.*

Neither the duration of the initial survey nor its scope could be great enough to yield the whole of the information necessary for the full attainment of all these objectives. The B.A.E. therefore proposes to continue the survey in later years, both by interviews in the field and by postal questionnaires.

The B.A.E. is anxious to publish the results of the survey as soon as possible. It therefore will issue a series of State reports as the analysis for each State is completed, as well as a report covering the industry on an Australia-wide basis.

This report on the industry in Queensland is the first of the State reports.

T. H. Strong,
Director,
Bureau of Agricultural Economics

Canberra, A.C.T.,
March 1956

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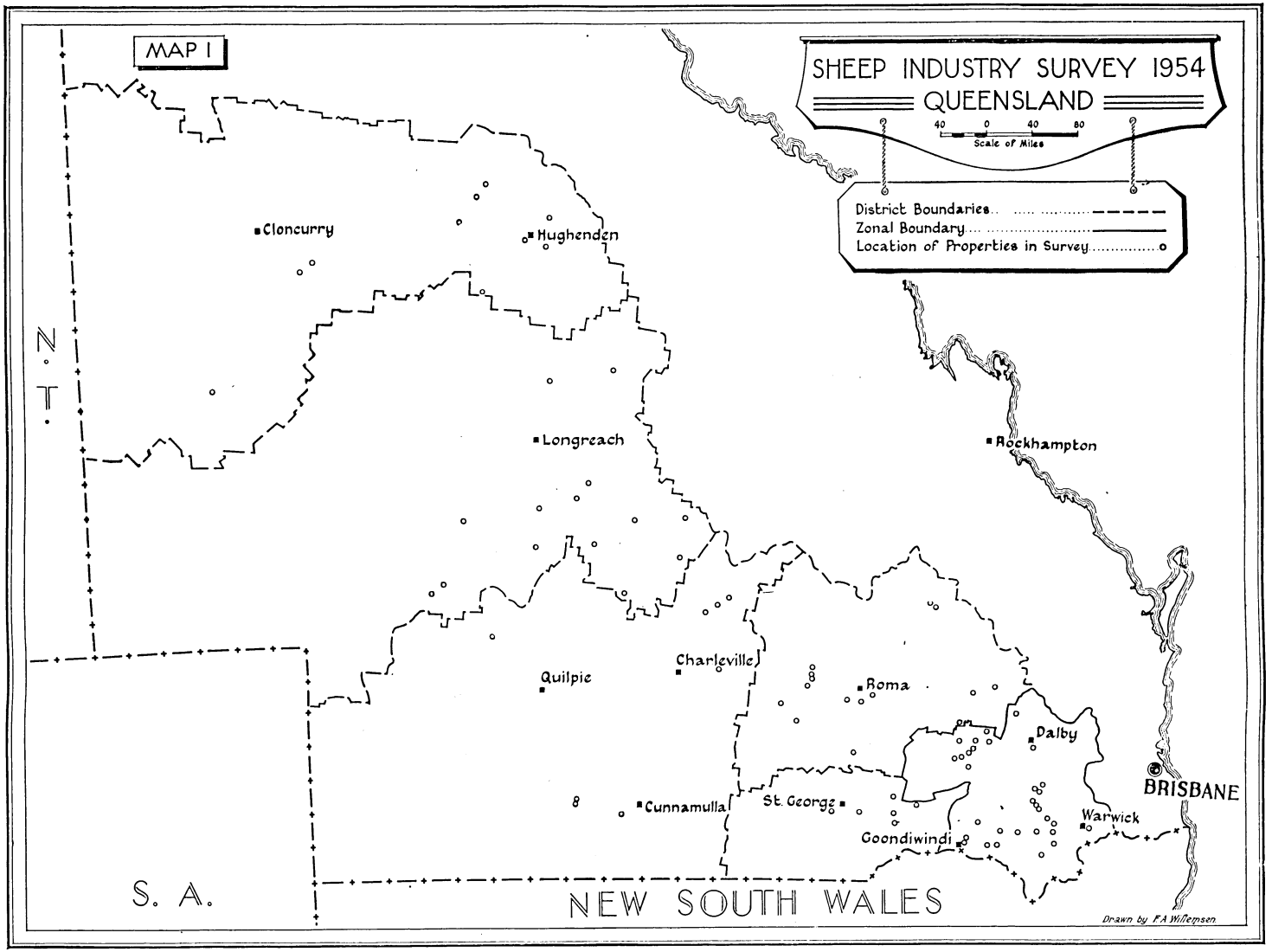

MAP I
SHEEP INDUSTRY SURVEY 1954
QUEENSLAND
40 0 40 80
Scale of Miles
District Boundaries
Zonal Boundary
Location of Properties in Survey
Cloncurry
Hughenden
Longreach
Rockhampton
Charleville
Quilpie
Roma
Dalby
BRISBANE
Cunnamulla
St. George
Warwick
Goondiwindi
N. T.
S. A.
NEW SOUTH WALES
Drawn by F.A. Wilhelmsen.

The Australian Sheep Industry: Queensland

Part I : Introduction

THE BUREAU OF AGRICULTURAL ECONOMICS undertook in 1954 a survey of the Australian sheep industry, covering all the major sheep carrying areas of the Commonwealth. The survey was designed primarily to obtain details of the financial results of sheep properties for the year 1952-53. At the same time information was collected on certain physical aspects of the industry.

The survey is the first step in the development of a continuing study of the sheep industry.

The sample surveyed in Queensland numbered 70 properties, of which 50 were located in the pastoral area and 20 in the wheat-sheep area. (See Map 1.)

Tables A and B summarize certain physical aspects and the financial results for 1952-53 of these 70 Queensland properties :

TABLE A.

SUMMARY OF PHYSICAL ASPECTS : AVERAGE OF SAMPLE PROPERTIES : BY ZONES 1952-1953.

Item	Unit	Wheat-sheep zone (20 properties)	Pastoral zone (50 properties)	Queensland (70 properties)
Area	acres	5,593	32,555	24,566
Sheep	number	1,539	5,228	4,174
Cattle	number	96	156	139
Area under crop or pasture	acres	94	7	32
Ewes mated	number	455	2,297	1,771
Lambs marked	number	266	1,146	895
Lambs marked as % ewes mated	percentage	58·5	49·9	50·5
Sheep and lambs shorn	number	1,627	5,548	4,428
Wool produced	lb.	14,514	47,112	37,799
Cut per head	lb.	8·9	8·5	8·5
Price per lb.	pence	93·62	90·85	91·16

The Bureau of Agricultural Economics began its survey of the sheep industry in Queensland in June, 1954. It was the first comprehensive economic study of the industry to be undertaken in the State since 1939, when the Queensland Wool Advisory Commissioner submitted his report to the Premier of that State[1]. The two studies were made in quite different circumstances, for whereas in 1939 the industry was suffering a financial depression, in 1954 it was enjoying general prosperity.

The B.A.E. had made a study of the industry in the Longreach-Blackall district during 1949. This included 31 properties and covered the financial years 1945-46, 1946-47 and 1947-48[2]. Ten of the properties were re-surveyed in 1952 to cover the intervening financial years to 1951-52.

During 1951 the Royal Commission on Pastoral Lands Settlement (Queensland) made another investigation which is in some respects pertinent to the present survey, but which is not concerned exclusively with the sheep industry[3].

In this present survey, which takes in the whole of Australia, the B.A.E. has sought to discover the structure of costs, the relationships between costs and returns, and the profitability of various types of sheep enterprises in the several zones, States and regions of Australia. It has also examined the effects of flock size, associated enterprises, and various practices in management and in sheep husbandry upon the financial structures and performances of sheep properties.

Survey Method.

For the purposes of the survey the B.A.E. divided Queensland's sheep areas into two zones, the Pastoral zone and the Wheat-sheep zone. The sheep areas and the boundary between the zones are shown in Map No. 1.

1. Report of the Wool Advisory Commission. W. L. Payne. Queensland Government Printer : A.23—1939.
2. *Regional Studies of the Australian Woolgrowing Industry* : Longreach-Blackall District (Queensland). Bureau of Agricultural Economics, Canberra, 1951.
3. Report of the Royal Commission on Pastoral Lands Settlement (Queensland) 1951. Queensland Government Printer : A.43—1951.

TABLE B.

SUMMARY OF FINANCIAL RESULTS : AVERAGE OF SAMPLE PROPERTIES : BY ZONES 1952-53.

Item	Wheat-sheep zone (20 properties)		Pastoral zone (50 properties)		Queensland (70 properties)	
	£	£	£	£	£	£
Total capital :		35,046		57,321		50,957
of which						
Land and improvements	26,834		36,892		34,019	
Plant	2,358		2,901		2,746	
Livestock	5,854		17,528		14,192	
Gross returns :		7,352		20,495		16,740
of which						
Sheep and wool	6,370		19,498		15,748	
Cattle	358		975		799	
Cereal	605		14		183	
Costs :		3,588		9,036		7,479
of which						
Labour	1,400		3,539		2,928	
Materials	894		2,172		1,807	
Services	759		2,294		1,855	
Rent and depreciation	535		1,031		889	
Farm income :		3,764		11,459		9,261
Charge against capital (5%)	1,752		2,866		2,548	
Labour and management income	2,012		8,593		6,713	
Farm income :		3,764		11,459		9,261
Charge for operator's labour	658		658		658	
Return to capital and management	3,106		10,801		8,603	
	%		%		%	
Rate of return on capital	8·8		18·8		16·9	

Partly for administrative convenience and partly to allow a comparison of properties located in the State's several different kinds of sheep country, the B.A.E. divided the Queensland sheep area into several arbitrary regions, the boundaries of which usually followed either the boundaries of local government regions or the boundaries of other local government areas.

These regions are :

Downs Region (or Wheat-sheep zone) ; Maranoa and Western Downs Region ; Warrego Region ; Western Plains Region ; Border Plains Region and North-western Region.

The boundaries of these regions are shown in Map No. 1.

The State sample for Queensland numbered 70 properties, of which 20 were located within the Wheat-sheep zone and 50 within the Pastoral zone. This gave each of the two zones their correct weighting in terms of property numbers.

However, as a sample of 20 properties was not considered sufficiently large for a separate study of the Wheat-sheep zone, a further 10 properties were surveyed in this area.

The locations of all the sample properties are shown in Map No. 1.

Officers of the B.A.E. visited each of the sample properties, interviewed the owner and obtained from him information about the physical features of the property, its products and its finances. When necessary, the owner authorized the B.A.E. to go to his woolbrokers for further information about the property's production and sale of wool and to his accountant for further financial information.

All the information collected during the survey and analysed pertained to the financial year 1952-53.

For the purposes of the survey, a woolgrowing property was taken to be any property :

1. Which ran 200 sheep or more during 1952-53.
2. Which provided full-time occupation for one man.
3. Which was not a stud, nor a multiple holding, nor a property used principally for dealing.

Sheep Industry in Queensland.

In 1955 the sheep population of Queensland was 19·9 million head, or about 13 per cent of the Australian total. Slightly more than 98 per cent of the State's sheep were merinos.

Most Queensland sheep were run under the "extensive" grazing conditions of the pastoral zone. The rest were run under more "intensive" conditions on the Darling Downs, a region in the south-eastern corner of the State, where they are sometimes associated with cereal crops.

The State contains about 4,500 flocks. The average flock comprises about 4,000 head, easily the largest average for any Australian State.

About 1,000 flocks comprise fewer than 500 sheep and contain in all about 150,000 sheep.

TABLE No. 1.

FREQUENCY DISTRIBUTION OF FLOCK SIZES: QUEENSLAND: 1950.

Size of flock	No. of flocks	Percentage of total no. of flocks	Thousands of sheep
Under 100	541	12·0	19
100 to 499	465	10·3	129
500 to 999	413	9·2	305
1,000 to 1,999	629	14·0	913
2,000 to 4,999	1,320	29·2	4,378
5,000 to 9,999	810	18·0	5,572
10,000 and over	333	7·3	6,266
Total	4,511	100·0	17,582

Source: Queensland Year Book.

Seasonal Conditions During 1952-53.

All but a few of Queensland's sheep are run in areas with average annual rainfalls of between ten inches and 25 inches, but this average is not to be relied on in any year. The industry suffers severe, frequent and widespread droughts which temporarily reduce the sheep numbers of the State and the volume of its primary production.

During 1951 and until the early Autumn of 1952, a severe drought gripped most pastoral areas. The Winter of 1952 was a good season, except in the North-west, where very dry conditions persisted until February, 1953. In short, seasonal conditions were good during the year of the survey except in the north-western part of the State, where drought prevailed.

Part II: Land Use

Land Tenure.

Of the State's total area, 82·2 per cent was held under lease from the Crown, 7·1 per cent was freehold and 10·7 per cent was unoccupied. The greatest concentration of freehold land is in the south-east of the State. This situation was reflected in the tenure of land occupied by the survey properties. For those in the Downs and Maranoa and Western Downs regions the proportion of freehold land was about 60 per cent, while in the other regions the survey properties were almost entirely on leasehold land.

Present Land Use.

Table No. 2 sets out the land use on the properties covered by the survey.

Potential Land Use.

The owner of each of the sample properties made an estimate of the more intense uses to which his land could profitably be put. These uses were classified as :

Arable : land suitable for cropping.

Top-dressing : land unsuitable for improved pasture but suitable for improvement by top-dressing.

Improved pastures : land suitable for improved pasture.

Natural pasture : land suitable for natural pastures only.

Unimprovable : land lacking any present economic potential.

Table No. 3 sets out the owners' estimates of the potential of their land for the 70 sample properties.

TABLE No. 2.

LAND USE DURING 1952-53 : SAMPLE PROPERTIES : BY ZONES.

Land use	Wheat-sheep zone (20 properties)		Pastoral zone (50 properties)		Queensland	
	Acreage	%	Acreage	%	Acreage	%
Cereal or other crops	1,794	2·0	152		1,946	0·1
Lucerne (for hay)	56	0·1			56	
Improved pasture (incl. grazing lucerne)	28		200		228	
Area not used	5,330	5·8	13,400	0·8	18,730	1·1
Natural pasture	84,656	92·1	1,613,983	99·2	1,698,639	98·8
Totals	91,864	100·0	1,627,735	100·0	1,719,599	100·0

The figures clearly indicate how heavily the sheep industry in Queensland relies upon natural pastures. Of the total area of the 70 properties, only slightly over 0·1 per cent was cultivated for cropping or carried improved pastures.

Even in the Wheat-sheep zone, which contains most of the cultivated land in the Queensland sheep areas, the emphasis on sheep properties is overwhelmingly on natural pasture. Only slightly more than 2 per cent of the total land was under crop or improved pasture. There was some cropping on properties in the pastoral zone, mostly in the Roma district, but it was of a minor nature and the area cropped in relation to the total area of properties in the Pastoral zone was insignificant.

TABLE No. 3.

ESTIMATES OF POTENTIAL LAND USE : SAMPLE PROPERTIES.

Estimated potential	Acreage	Percentage of total acreage
Arable	27,351	1·6
Top-dressing	2,993	·2
Improved pastures	25,635	1·5
Natural pastures	1,656,413	96·5
Unimprovable	3,466	·2
Totals	1,715,856	100·0

The table indicates that, given present technology and prices, very little of the State's sheep area would

be capable of more intense use.. The owners of the 70 properties estimated that less than 4 per cent of the total area of the properties could be used more intensively. However, the most recent developments in cropping for fodder conservation in pastoral areas could change this picture.

Table No. 4 sets out, for the two zones, the owners' estimates of the potential of their lands.

TABLE No. 4.

ESTIMATES OF POTENTIAL LAND USE : SAMPLE PROPERTIES : BY ZONES.

Estimated potential	Wheat-sheep zone (30 properties)(a)		Pastoral zone (50 properties)	
	Acreage	percentage of total acreage	Acreage	percentage of total acreage
Arable	24,175	18·3	11,235	0·7
Top-dressing	4,490	3·4	–	–
Improved pastures	38,300	28·9	100	–
Natural pastures	65,119	49·3	1,613,000	99·1
Unimprovable	100	0·1	3,400	0·2
Totals	132,184	100·0	1,627,735	100·0

(a) Figures for the extra 10 properties surveyed in the Wheat-sheep zone have been included to provide the best possible estimate for that zone.

Table No. 4 indicates that the greater part of the land which the owners estimate to be capable of more intense use is located within the Wheat-sheep zone. Of the total area of the 50 properties in the Pastoral zone, only 0·7 per cent was estimated to be capable of more intense use, whereas of the total area of the properties in the Wheat-sheep zone almost one-half was estimated to be capable of more intense use.

Most of the land in the sheep-wheat zone which is estimated to have unused potentials lies in the area which enjoys an average annual rainfall of between 20 in. and 30 in. Much of it is overgrown with dense brigalow scrub.

The difficulties of clearing the brigalow and of killing the suckers which shoot prolifically from old roots have impeded the development of the country. But recent advances in the techniques of mechanical clearing are assisting the rate of development. In addition, the introduction of aerial spraying with hormones may provide a powerful new aid to opening up the country.

The small potentially arable area of the Pastoral zone is in the eastern part of the Maranoa and Western Downs regions, an area through which the belt of brigalow scrub extends.

Part III: Features of the Sheep Industry in Queensland

Property Size.

The size of properties covered by the survey ranged from just under 1,000 acres to almost 200,000 acres. The smallest properties were in the Wheat-sheep zone, where the range was from under 1,000 acres to 15,000 acres. In the Pastoral zone, the variation in property size was much greater, ranging from 1,000 acres to almost 200,000 acres.

Table No. 5 shows the distribution of the sample properties in the two zones by property size.

TABLE No. 5.

FREQUENCY DISTRIBUTION OF PROPERTY SIZES: BY ZONES.

Property size	Wheat-sheep zone	Pastoral zone	Queensland
acres	2	—	2
Less than 1,000	3	1	4
1,000 and under 2,000	7	6	13
2,000 „ „ 5,000	5	4	9
5,000 „ „ 10,000	3	11	14
10,000 „ „ 20,000		20	20
20,000 „ „ 50,000		5	5
50,000 „ „ 100,000		3	3
100,000 „ „ 200,000			
Total	20	50	70
Average (acres)	4,593	32,555	24,566

The carrying capacity of the sheep area in Queensland ranges from the very low carrying of the extreme West and North-west to "sheep to the acre" country on the Darling Downs. An indication of the range of carrying capacity is given in Table No. 6 which shows the average stocking rate on the sample properties in 1952-53.

No property surveyed exceeded one sheep to the acre in 1952-53 although two properties on the Darling Downs ran almost a sheep to the acre. At the other extreme, one property in the North-west with numbers reduced through drought ran only one sheep to almost 30 acres. More than half of the sample properties in the Pastoral zone ran less than one sheep to five acres.

Enterprises on Sheep Properties.

For the purpose of analysis, the property enterprise has been classified under one of three headings.

1. *Sheep only*: possibly some cattle, but not sufficient to be included under 2.
2. *Sheep-cattle*: properties which carried at least 40 head of cattle, and in addition had a cattle to sheep ratio of more than 3 per cent.
3. *Sheep-cereal*: properties which received income from the sale of grain or cereal hay.

Table No. 7 (p. 7) shows the numbers of properties classified under these headings, and the numbers of sheep concerned.

TABLE No. 6.

FREQUENCY DISTRIBUTION OF STOCKING RATES: BY ZONES 1952-53.

Stocking rate	Wheat-sheep zone	Pastoral zone	Queensland
Less than 1 sheep to 20 acres	—	1	1
1 sheep to 20 ac. and less than 1 sheep to 10 ac.	1	4	5
1 sheep to 10 ac. and less than 1 sheep to 5 ac.	1	22	23
1 sheep to 5 ac. and less than 1 sheep to 3 ac.	5	12	17
1 sheep to 3 ac. and less than 1 sheep to 2 ac.	3	9	12
1 sheep to 2 ac. and less than 2 sheep to 3 ac.	8	1	9
2 sheep to 3 ac. and less than 1 sheep to 1 ac.	2	1	3
Total	20	50	70
Average	1 sheep to 3 ac.	1 sheep to 6¼ ac.	1 sheep to 5¾ ac.

In numbers of properties and sheep, the sheep only type of enterprise was the most important. The relatively high proportion of sheep-cattle properties in the Wheat-sheep zone is due to the

TABLE No. 7.

ENTERPRISE CLASSIFICATION: BY ZONES.

Enterprise	Wheat-sheep		Pastoral		Queensland	
	Properties	Sheep	Properties	Sheep	Properties	Sheep
Sheep only	6	6,604	29	160,663	35	167,267
Sheep-cattle	10	18,950	20	99,573	30	118,523
Sheep-cereal	4	5,227	1	1,150	5	6,377
Total	20	30,781	50	261,386	70	292,167

fact that this zone included large areas—chiefly along the N.S.W.-Q'ld. border—which were unsuited to cropping because of the nature of the terrain. The cattle referred to are all beef cattle.

The low number of properties with sheep and cereal cropping associated is a striking feature. Examination of published statistics indicates that this is to be expected as cereal cropping on the Darling Downs is more usually associated with dairying or pigs than with sheep.

The term Wheat-sheep zone is, then, something of a misnomer when applied to this area. Developments occurring now in the clearing of brigalow country may well lead to a far more widespread association between cropping and sheep, such as is common in the southern States.

Sheep Enterprises.

The properties included in the survey were further classified according to type of sheep enterprise. The classes recognised for Queensland are:

1. Merino woolgrowing—dry sheep.
2. Merino woolgrowing—breeding replacements.
3. Merino woolgrowing—breeding and selling surplus young sheep regularly.
4. Crossbred woolgrowing—including Polwarths and Corriedales.
5. Fat lamb production—from crossbred ewes.

On a few properties two of these enterprises were combined; but for purposes of classification the enterprise involving the greater number of sheep was taken.

Table No. 8 sets out the sheep enterprise classification according to zone.

The majority of properties are of the merino woolgrowing and breeding replacements type. Only five properties were breeding a regular surplus of young sheep, and these were located, with one exception, in the southern pastoral area.

At the other extreme, there were eight dry sheep properties. One of these was located in the rough country in the eastern part of the Maranoa-Western Downs Region; three were on undeveloped brigalow country in the north of the Downs Region; and four were further south, not far from the N.S.W. border; two on the Darling Downs, and two just to the west. In this latter area two additional properties, now breeding, indicated their intention to change to dry sheep.

The two crossbred woolgrowers—both with comeback flocks, one using Merino rams and the other Polwarths—were located on the eastern part of Warrego Region.

TABLE No. 8.

SHEEP ENTERPRISE CLASSIFICATION: BY ZONES.

Sheep enterprise	Wheat-sheep		Pastoral		Queensland	
	Properties	Sheep	Properties	Sheep	Properties	Sheep
Merino: wethers	5	8,034	3	3,920	8	11,954
Merino: breeding replacements	13	20,373	41	230,902	54	251,275
Merino: breeding surplus	1	1,285	4	24,760	5	26,045
Crossbred fat lambs	1	1,089			1	1,089
Crossbred wool-growing			2	1,804	2	1,804
Total	20	30,781	50	261,386	70	292,167

Flock Size.

The flock size distribution of the properties covered in the survey is reasonably close to that revealed by the last official published data (1948), as shown in Table No. 9.

TABLE No. 9.

FREQUENCY DISTRIBUTION OF FLOCK SIZES: STATISTICIAN'S AND SURVEY FIGURES.

Flock size	1948 Statistics	Percentage of total	Survey	Percentage of total
250 and under 500	224	6	2	3
500 „ „ 1,000	403	12	8	11·5
1,000 „ „ 2,000	598	18	17	24
2,000 „ „ 5,000	1,145	33	24	34
5,000 „ „ 10,000	742	21	14	20
10,000 „ „ 20,000	252	7	4	6
20,000 and over	94	3	1	1·5
	3,458	100	70	100

The average flock size for the 20 properties in the Wheat-sheep zone was 1,539, ranging from 485 to 4,279. In contrast, the average flock in the Pastoral zone was 5,228, ranging from 625 to over 30,000 head.

TABLE No. 10.

FREQUENCY DISTRIBUTION OF FLOCK SIZES: BY ZONES.

Flock size	Wheat-sheep	Pastoral	Queensland
250 and under 500	2	—	2
500 „ „ 1,000	4	4	8
1,000 „ „ 2,000	9	8	17
2,000 „ „ 5,000	5	19	24
5,000 „ „ 10,000	—	14	14
10,000 „ „ 20,000	—	4	4
20,000 and over	—	1	1
Total	20	50	70
Average (sheep)	1,539	5,228	4,174

Breeding.

Of the 70 properties in the Queensland sample, 62 were breeding. These 62 properties include two properties in the Wheat-sheep zone, classified as merino woolgrowing—dry sheep which had also small flocks of breeding ewes. On the other hand, two properties in the North-western region, classified as merino-woolgrowing-breeding replacements, did not join any ewes in 1952-53 because of the drought.

The number of breeding ewes expressed as a percentage of the total flock ranged from under 10 per cent, to more than 80 per cent, with the majority between 20 per cent and 60 per cent.

The average figure revealed by the survey was 42·4 per cent, which compares very closely with the figure published by the Queensland Government Statistician for that year, 43·1 per cent.

Merino ewes were the dominant breed used—85·5 per cent of all ewes in the Wheat-sheep zone and 99·3 per cent of all ewes in the Pastoral zone. The other important group in the Wheat-sheep zone was crossbreds, 13·1 per cent.

On just over half the properties in the survey maiden ewes were joined at one and a half years; about one-third joined at two years; and the balance older.

TABLE No. 11.

FREQUENCY DISTRIBUTION OF PERCENTAGES OF BREEDING EWES TO TOTAL FLOCK: BY ZONES.

Breeding Ewes	Wheat-sheep	Pastoral	Q'land
	per cent		
No breeding 1952-53	3	5	8
under 10	1	—	1
10 and under 20	1	1	2
20 „ „ 30	5	6	11
30 „ „ 40	4	5	9
40 „ „ 50	4	11	15
50 „ „ 60	—	10	10
60 „ „ 70	2	7	9
70 „ „ 80	—	4	4
80 and over	—	1	1
	20	50	70
Average (percentage)	29·6	43·9	42·4

Culling of maiden ewes was not widely practised. Only on 25 per cent of the properties visited was this a regular practice, and the percentage of maiden ewes culled was low. None of the 70 properties culled ewes at subsequent joinings for infertility.

The age at which ewes were cast ranged from four years to seven years or more—most were in the latter category. However, on half the properties visited ewes were not cast for age at all, but allowed to die on the place. This reflects the difficulty experienced by graziers, particularly in the northern areas, in maintaining flock numbers, due to generally poor lambing figures.

The rams used were predominantly merinos (95 per cent). The remainder were Corriedales, Southdowns or Polwarths. The number of rams used as a percentage of ewes joined ranged from 1 per cent to 3·5 per cent, the average being about 2 per cent.

Lambing.

The survey data shows that over the greater part of Queensland there are two main lambing periods. The first centres on May, but extends to April and June, and accounts for about 25 per cent of lambs. The second centres on August-September, extending to July and October. About 55 per cent of lambs are dropped in this period.

The balance are accounted for by summer lambings in the Far North. In this area there is a distinct incidence of late summer rainfall and feed is more plentiful at this time.

The percentage of lambs marked to ewes mated ranged from a few almost complete failures to more than 100 per cent; the average was 50·5 per cent.

TABLE No. 12.

FREQUENCY DISTRIBUTION OF PERCENTAGE OF LAMBS MARKED TO EWES MATED: BY ZONES.

Lambs Marked	Wheat-sheep zone	Pastoral zone	Q'land
percentage			
0 and under 10	—	2	2
10 „ „ 20	1	2	3
20 „ „ 30	1	1	2
30 „ „ 40	—	4	4
40 „ „ 50	5	8	13
50 „ „ 60	3	10	13
60 „ „ 70	1	8	9
70 „ „ 80	1	8	9
80 „ „ 90	2	1	3
90 „ „ 100	—	—	—
100 and over	3	1	4
Total	17	45	62
Average (percentage)	58·5	49·9	50·5

Disposal of Surplus Sheep.

Sheep sold from the sample properties in 1952-53 numbered 28,716, or just on 10 per cent of the average number carried through the year. These sales fell into three broad categories: the turn-off of surplus young wethers from breeding properties; the disposal of older sheep, both ewes and wethers, which, while cast for age by the selling property, still had value for further breeding and woolgrowing, and the sale of sheep destined for slaughter.

The first class, young wethers, made up 20 per cent of the total sales. The majority were sold from properties in the areas adjoining New South Wales. Most of the second category, which made up 35 per cent of total sales, were older wethers, aged four or five years, sold for further woolgrowing. They came, principally, from the Central-west. There were also some older ewes sold for further breeding.

Sheep destined for slaughter made up the remaining 45 per cent of sales. They came from all areas except the North-west. About half of these were fats, almost all of them sold at Cannon Hill markets. These included the fat lambs sold from the one fat lamb producing property included in the sample. The remainder were sold for fattening (mainly to properties on the Darling Downs) prior to slaughter.

It was notable that the only sheep sold from properties in the North-west were younger sheep sold early in the year to lighten stocking rates in the drought.

Shearing.

The pattern of shearing in Queensland by months and regions is very clearly shown in a tabulation published by the Government Statistician. The figures refer to the year 1953-54. They are reproduced in Table No. 13.

In commenting on these figures in Bulletin No. 12, 1955, the Statistician said:

"Over one-half (51·8 per cent) of the season's shearings took place during the four months July to October, 1953; nearly one-third (30·1 per cent) during the four months March to June, 1954 and nearly one-fifth (18·1 per cent) during the Summer, November, 1953, to February, 1954. Amongst individual months, September showed the greatest number of sheep shorn, 3,117,898, followed by August with 2,586,154. In all main sheep divisions shearing rose to a peak in August or September and fell to a low level in December and January. Another smaller peak occurred in March and April, followed by a decline to June—the month when shearing operations were at their lowest level. June's total shearings of 412,158 sheep were a little less than those of the lowest summer month, December, with 557,108. Roma and South-western dis-

TABLE No. 13.

SHEARING: BY MONTHS: QUEENSLAND
1953-54.

Statistical Division	Number of sheep and lambs shorn each month from July 1, 1953 to June 30, 1954.												
	July	August	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	Total
Downs, Moreton and Maryborough	235,157	433,412	708,832	423,435	206,212	121,090	162,729	145,834	388,268	212,224	126,436	43,135	3,206,754
Roma	397,770	370,592	507,273	347,854	225,334	135,924	150,847	276,702	560,081	331,209	134,206	50,430	3,488,222
South-Western...	617,315	414,729	550,915	339,035	102,245	74,762	137,044	287,102	603,499	530,856	274,950	122,346	4,054,798
Total South Queensland ...	1,250,242	1,218,733	1,767,020	1,110,314	533,791	331,776	450,620	709,638	1,551,848	1,074,289	535,592	215,911	10,749,774
Rockhampton	2,307	8,797	23,308	2,315	7,030	1,536	736	2,544	4,260	14,282	10,050	94	77,259
Central-Western	385,996	665,207	600,229	298,994	267,237	144,399	125,121	253,373	452,856	319,443	305,290	99,560	3,917,705
Far-Western	213,634	441,104	323,926	142,909	98,342	11,427	29,048	90,410	164,655	213,920	138,273	78,964	1,946,612
Total Central Queensland ...	601,937	1,115,108	947,463	444,218	372,609	157,362	154,905	346,327	621,771	547,645	453,613	178,618	5,941,576
North-Western	237,548	252,313	403,415	294,251	142,035	67,970	57,191	38,665	111,709	185,674	112,091	17,629	1,920,491
Total Queensland[(a)] ...	2,089,727	2,586,154	3,117,898	1,848,783	1,048,435	557,108	662,716	1,094,630	2,285,328	1,807,608	1,101,296	412,158	18,611,841

(a) Total includes small numbers from Mackay, Townsville, Cairns and Peninsula.

Source: Government Statistician's Office, Brisbane.

trict were the only divisions in which shearings in the peak month of late Summer were as numerous as in the peak spring months."

In the course of the survey, B.A.E. officers collected further information on shearing practices. The means by which shearing was undertaken have been grouped under three headings :

1. Contract.
2. Cost-plus.
3. Owner—including shearing by hired day labour.

Of the 70 properties in the survey, 32 used the contract method, five cost-plus, and on the other 33 shearing was undertaken by the owner. There was a very marked preference for contract shearing on the larger pastoral holdings.

Most properties shore in their own sheds, 98 per cent in pastoral districts and 87 per cent in the Downs district. The number of stands ranged from one to five in the latter, with the majority using 2-stand plants. In the pastoral zone, stands ranged from one to 24, with 90 per cent using from two to six.

The B.A.E. sought information on the proportion of wool classed by qualified classers. Of the 70 properties, 32 employed a qualified classer, four had the whole clip classed by a broker and 34 employed classers without formal qualifications. This last category was chiefly owner-classers.

The numbers of sheep involved were :

Wool classed by :

Qualified man : 214,679 (69 per cent)
Broker : 2,894 (1 per cent)
Unqualified man : 92,353 (30 per cent).

Total 309,926.

These figures suggest that probably some 30 per cent of Queensland wool production is not classed by a qualified classer. However, the price received for wool handled by unqualified classers was identical with that received for wool handled by qualified classers.

Fleece Weights.

The average cut per head for sheep and lambs together on all 70 properties was 8·5 lb. However, this average conceals a wide range of cuts on individual properties. The distribution of cuts per head was as shown in Table No. 14.

Some of the light-cutting Pastoral zone properties reflect the drought conditions which existed in the North-west during the year covered by the survey. Most of the properties fell in the groups cutting between 7 lb. and 10 lb. per head.

TABLE No. 14.

FREQUENCY DISTRIBUTION OF CUTS PER HEAD : BY ZONES.

Cut per head	Wheat-sheep	Pastoral	Q'land
lb.			
Under 5	—	3	3
5 and under 6	1	4	5
6 „ „ 7	1	3	4
7 „ „ 8	5	11	16
8 „ „ 9	6	8	14
9 „ „ 10	2	12	14
10 „ „ 11	3	6	9
11 and over	2	3	5
Total	20	50	70
Average	8·9 lb.	8·5 lb.	8·5 lb.

The district differentials were :

TABLE No. 15.

AVERAGE CUT PER HEAD : BY DISTRICTS : SAMPLE PROPERTIES.

District	Adult sheep only	Sheep and lambs
	lb.	lb.
Downs District	9·6	8·9
Maranoa and Western Downs	9·1	8·3
Warrego	9·6	8·4
Western Plains	9·4	8·7
Border Plains	9·8	8·6
North-western	7·4	7·4

Some interesting figures are revealed in a study of cut per head according to type of sheep enterprise, as shown in Table No. 16.

TABLE No. 16.

AVERAGE CUT PER HEAD : BY SHEEP ENTERPRISES : SAMPLE PROPERTIES.

Sheep enterprise	Cut per head (sheep and lambs)
	lb.
Merino woolgrowing—wethers	10·16
„ „ breeding replacements	8·37
„ „ —breeding surplus young sheep	9·46
Crossbred woolgrowing	7·11
Crossbreds with fat lambs	7·95

The high cut of the third category can probably be explained by two factors—first their location on better class country and second, the lower proportion of aged sheep in these flocks.

The crossbred woolgrowers were located on the eastern fringe of the sheep area, and their low cuts are probably explained as much by their location as by their type of sheep.

The effects on cut per head of the proportion of breeding ewes to total flock, and of flock size, were examined. No significant differences were revealed that could not be accounted for by some other factor such as location, or type of enterprise. In terms of total production, clips ranged from six bales up to 1,000 bales.

Diseases and Pests.

Certain information was sought from property owners on the occurrence of diseases and pests of economic significance, and on the control measures undertaken.

The reader is referred to the comprehensive set of pamphlets available from the Sheep and Wool Branch, Queensland Department of Agriculture and Stock, for a full account of diseases and pests of significance to the sheep industry in Queensland. The following paragraphs are chiefly concerned with control measures undertaken by the graziers visited.

Fly-strike.

Next to drought, fly-strike is probably the most serious problem of the industry in Queensland.

Crutching, jetting and mulesing, in that order, were the means of control used. There was one property which did not use any control.

Table No. 17 sets out the number of properties using various controls and the number of sheep on these properties.

TABLE No. 17.

FLY-STRIKE CONTROL: SAMPLE PROPERTIES.

Crutching		Jetting		Mulesing	
Properties	Sheep	Properties	Sheep	Properties	Sheep
68	280,831	35	178,602	10	57,461

It is clear that, while all but two properties relied on crutching, many used jetting and/or mulesing as an additional control.

The combinations of control measures are set out in Table No. 18.

TABLE No. 18.

FLY-STRIKE CONTROL: COMBINATIONS OF MEASURES: SAMPLE PROPERTIES.

Treatment	Crutch more than once	Crutch once	No crutching
Mules and jet	2	4	0
Mules	2	2	0
Jets	6	22	1
No other	5	25	1

The table shows that the most common control was one crutching with no other treatment, then one crutching with jetting. Six graziers combined mulesing, jetting and crutching. It is interesting that all graziers who performed the mules operation combined it with some other form of treatment.

External Parasites (Ticks, Lice, Itch Mites).

The usual method of controlling sheep ticks, lice and itch mites, which are a source of some economic loss to the industry, is dipping. However, 16 of the 70 properties did not dip, but these were located chiefly in the North-central and North-west parts of the sheep areas. About 25 per cent of the sheep in the Pastoral zone were not dipped. Spray type dips were slightly more favoured than plunge dips.

Arsenic	: 41	properties
Benzene hexachloride	: 11	,,
D.D.T.	: 1	,,
Arsenic and derris	: 1	,,
	54	,,
No dipping	16	,,
	70	properties

Rabbits.

Rabbit infestation in Queensland is confined to the southern and south-western parts of the State, and to a small area near Mitchell, with the greatest concentration in the higher rainfall belt of the Western Darling Downs and the Goodiwindi District. Unsuitability of soil and unfavourable seasonal conditions have prevented the spread of rabbits northwards, and a rabbit-proof fence has checked their eastward movement.

Before the establishment of myxomatosis rabbit infestation was a source of serious economic loss to

Queensland. However, the disease spread rapidly into Queensland from New South Wales during January, 1951, and became established on all river systems in rabbit-infested areas. Within a few months whole colonies of rabbits had been wiped out and kills of up to 90 per cent were reported in many areas. There was some build-up in rabbit numbers over the next two or three years, but the 1954-55 season saw another very heavy kill, with rabbit numbers reduced to very low levels.

Of the 70 properties in the survey, 18 were in the area completely free from rabbits and 28 were free or near free, although located in areas subject to rabbits ; the remaining 24 reported some degree of rabbit infestation, although only two described their properties as being heavily infested. Among the group of 24, nine were carrying out control measures ; five trapping, two fumigating and two poisoning and trapping combined.

Dingoes.

Dingoes occur over the greater part of Queensland, but the main sheep areas are relatively free from this pest, although sheepmen on the outer fringes of the sheep belt do suffer losses, sometimes very heavy, from them. Twenty-nine of the 70 graziers interviewed reported dingoes as a major pest—some in the northern areas indicated their intention of changing from sheep to cattle on this account. Control measures taken by individual graziers were poisoning, shooting and trapping. In addition, an aerial poisoning campaign was carried out by the Government authority responsible for vermin control.

Other pests reported as being of economic significance were eagles (26 properties), foxes (28 properties), wild pigs (14 properties), crows (10 properties) and kangaroos (5 properties).

The Queensland Government pays bonuses for the destruction of dingoes, foxes, eagles, pigs and hares.

SHEEP FEEDING PRACTICES.

Fodder Conservation.

Fodder conservation as a regular practice was limited almost solely to the Downs Region, where seven of the 20 properties visited held reserves of grain or fodder. Only two of the 50 pastoral properties held such reserves. The average amount held was very small and amounted to only a few days' feeding at drought ration levels.

Hand Feeding.

During 1953 hand feeding was carried out on nine properties, on seven of which grain or fodder was purchased. Only two properties undertook hand feeding as a regular practice ; on the remainder it was the result of dry conditions.

Forage Cropping.

Almost half the properties in the Downs Region grew fodder crops, chiefly oats. In addition, one property near Taroom also grew oats. In the balance of the Pastoral zone forage cropping is impracticable, due to unfavourable climatic conditions. Forage crops were chiefly used for grazing lambing ewes and weaners.

Drought Policy.

Graziers were asked to state the policy followed during the most recent drought of their experience.

The policies adopted varied somewhat as between the Pastoral zone, and the more favoured Downs Region.

In summary, the answers were :

Policy	Downs Region	Pastoral zone
Sell stock	2	19
Agistment	7	6
Scrub cutting	4	21
Hand feeding	9	6
Let stock take chance	3	10

Many graziers combined scrub cutting with agistment, hand feeding and so on.

Questioned on future drought policy, 25 of the 70 indicated they would change from earlier practices.

In those districts where cropping is possible in the Wheat-sheep zone and in the more favoured areas of the Pastoral zone, 14 indicated they would embark on a programme of cropping and conservation of fodder against future droughts.

In the Pastoral zone six graziers indicated their intention to sell stock in future, rather than cut scrub or let stock take their chance as they had done in the past. A further five in the North-west indicated their intention to conserve bush hay.

Part IV: Financial Analysis

The principal objectives of the survey were concerned with financial aspects of the industry, i.e., with capital investment, returns, costs and various measures of income.

The methods used to calculate different income measures in this analysis were :

A. Gross returns = Returns from wool, profit or loss from sheep and cattle trading, and other returns.

B. Costs = Cash costs + depreciation.

C. Farm income = Gross returns − costs.

D. Return to labour and management = Farm income − interest on capital.

E. Return to capital and management = Farm income − charge for operator's labour.

F. Rate on Return on capital =

$$\frac{\text{Return to capital and management} \times 100}{\text{Capital}}$$

EXAMPLE OF CALCULATION OF INCOME MEASURES.

(Capital Value of Farm £50,000).

	£	£
A. Gross returns :		
Wool	9,000	
Sheep trading	500	
Cattle trading	250	
Other returns	250	
		10,000
B. Costs (Cash costs and depreciation)		6,000
C. Farm income		4,000
Less interest on capital at 5 per cent		2,500
D. Return to labour and management		1,500
Farm income		4,000
Less charge for operator's labour		658
E. Return to capital and management		3,342

F. Rate of return on capital = $\frac{3{,}342 \times 100}{50{,}000}$ = 6·68 per cent.

CAPITALIZATION.

A study of capital investment is an essential part of the financial analysis for several reasons :

It indicates the present value of investment per property.

It gives the sum on which the interest charge is calculated.

It is a measure against which incomes can be analysed, in comparing properties of various sizes and types.

The capital values used in this analysis are market values ruling at the time of the survey.

Land and improvements have been valued, allowing for title at the time of the survey, on this basis. But, to allow a full breakdown of the capital structure, the values of fences, yards, buildings and water points were calculated separately and deducted from the value of land and improvements, leaving a residual value for land.

Plant has been valued at written down cost, using standard depreciation rates, 15 per cent for vehicles and 10 per cent for other plant, rather than the special rates allowed for income tax purposes.

Sheep have been valued at the average price of all sheep purchased and sold on the 70 survey properties in 1952-53, i.e., £3 per head. This value has been applied to sheep on hand at July 1, 1952, to give the capital investment in sheep.

The values for cattle (£16) and horses (£15) were arrived at and applied in a similar manner.

The average capital and the capital structures arrived at on the basis described are shown in Tables Nos. 19 and 20.

TABLE No. 19.

AVERAGE CAPITALIZATION AND CAPITAL STRUCTURE : BY ZONES : SAMPLE PROPERTIES.

Item	Wheat-sheep zone		Pastoral zone		Queensland	
	£	%	£	%	£	%
Land	20,279	57·9	23,582	41·1	22,638	44·4
Water supply	1,658	4·7	4,305	7·5	3,549	7·0
Fencing	2,626	7·5	5,292	9·2	4,531	8·9
Buildings	2,271	6·5	3,713	6·5	3,301	6·5
Plant	2,358	6·7	2,901	5·1	2,746	5·4
Sheep	4,159	11·9	14,981	26·1	11,889	23·3
Cattle	1,560	4·4	2,327	4·1	2,108	4·1
Other stock	135	0·4	220	0·4	195	0·4
Total	35,046	100·0	57,321	100·0	50,957	100·0

Land is a higher proportion of capital in the Wheat-sheep zone, reflecting the higher land values in that area. On the other hand, sheep represent about one-quarter of total capital in the Pastoral zone, as against one-eighth in the Wheat-sheep zone. The only other item of difference is water supply which, naturally, is a greater proportion of capital in the semi-arid Pastoral zone.

TABLE No. 20.

AVERAGE CAPITALIZATION AND CAPITAL STRUCTURE : BY ENTERPRISES : SAMPLE PROPERTIES.

Item	Sheep only		Sheep-cattle		Sheep-cereals	
	£	%	£	%	£	%
Land	20,934	42·6	25,120	45·1	19,676	55·5
Water supply	3,709	7·6	3,641	6·5	1,871	5·3
Fencing	4,305	8·8	5,088	9·1	2,760	7·8
Buildings	3,218	6·6	3,546	6·4	2,414	6·8
Plant	2,420	4·9	2,842	5·1	4,452	12·5
Sheep	13,815	28·1	11,118	20·0	3,026	8·5
Cattle	495	1·0	4,140	7·4	1,210	3·4
Other stock	188	0·4	225	0·4	72	0·2
Total	49,085	100·0	55,720	100·0	35,479	100·0

The sheep-only and sheep-cattle enterprises have substantially similar capital structures, except for the stock items. In the sheep-cereal enterprise, land and plant are the major items, with stock less important.

The range of capitalization per property is shown in Table No. 21.

TABLE No. 21.

FREQUENCY DISTRIBUTION OF CAPITALIZATION : BY ZONES.

Capital	Wheat-sheep	Pastoral	Queensland
£10,000 and under £20,000	6	7	13
£20,000 and under £30,000	5	8	13
£30,000 and under £40,000	1	5	6
£40,000 and under £50,000	4	8	12
£50,000 and under £60,000	2	5	7
£60,000 and under £80,000	1	6	7
£80,000 and under £100,000	1	7	8
£100,000 and over	—	4	4
	20	50	70
Average	£35,046	£57,321	£50,957

The lowest value was £12,000 and the highest just over £350,000.

The average capital investment for the 70 properties per sheep equivalent and per acre is shown in Table No. 22.

The higher capital per sheep equivalent in the Wheat-sheep zone is a reflection of the lower risks involved in sheep raising in that zone; the higher value of cropping or potential cropping land; and the higher proportion of freehold land. Apart from these factors, distance from the markets and the disabilities of living in remote, semi-arid areas influence values in the Pastoral zone.

There was a fairly close inverse relationship between capital per sheep equivalent and property

TABLE No. 22.

AVERAGE CAPITAL INVESTMENT PER PROPERTY, PER SHEEP EQUIVALENT[(a)] AND PER ACRE : SAMPLE PROPERTIES.

Zone	Av. capital per property	Av. sheep equivs. per property[(a)]	Av. capital per sheep equiv.	Av. area (Acres)	Av. capital per acre
	£	number	£		£
Wheat-sheep zone	35,046	2,115	16·57	5,593	6·26
Pastoral zone	57,321	6,163	9·30	32,555	1·76
Queensland	50,957	5,008	10·17	24,566	2·07

(a) 1 beast = 6 sheep.

size—the larger the property the lower the capital per sheep equivalent. This relationship is shown in Graph I. Since the larger properties tend to be situated in the arid part of the State this is again a reflection of low land values being associated with high drought risks.

RETURNS.

Returns for the year 1952-53 have been grouped as follows :

(i) **Sheep enterprise** :

(a) *Wool* : Gross return from wool sold. (Wool selling charges have been included among costs).

(b) *Skins* : Value of sheepskins sold, if any.

(c) *Sheep trading* : The profit or loss from sheep trading. An opening value of £3 per head has been used, with natural increase brought in at the same value. Closing stock were valued at average cost on this basis, allowing also for purchases.

(ii) **Beef enterprise** :

(a) *Cattle trading* : Profit or loss from cattle trading. Opening stock and natural increase valued at £16, with closing stock at average cost.

(b) *Hides* : Value of hides sold, if any.

(iii) **Cereal cropping** : Total value of wheat or other cereals produced in 1952-53. Also any income from the sale of cereal hay.

(iv) **Other returns** : All other returns from the farm enterprise, e.g. agistment.

No account has been taken of income received from non-farming interests, or of farm produce consumed on the farm, other than stock killed for rations, which are accounted for in the stock trading accounts.

Table No. 23 sets out the average returns from various sources, with returns from wool and sheep trading accounts shown separately.

Average gross returns for the 70 properties were £16,740, of which about 94 per cent came from the sheep enterprise.

The range of total returns was as shown in Table No. 24.

TABLE No. 23.

AVERAGE RETURNS FROM DIFFERENT SOURCES: BY ZONES: SAMPLE PROPERTIES.

Zone	Returns from wool		Returns from sheep trading and skin sales		Returns from cereals		Returns from beef prod.		Other returns		Total returns
	£	%	£	%	£	%	£	%	£	%	£
Wheat-sheep	5,662	77·0	708	9·6	605	8·2	358	4·9	19	0·3	7,352
Pastoral	17,835	87·0	1,663	8·1	14	0·1	975	4·7	8	—	20,495
Queensland	14,357	85·8	1,391	8·3	183	1·1	799	4·7	11	0·1	16,740

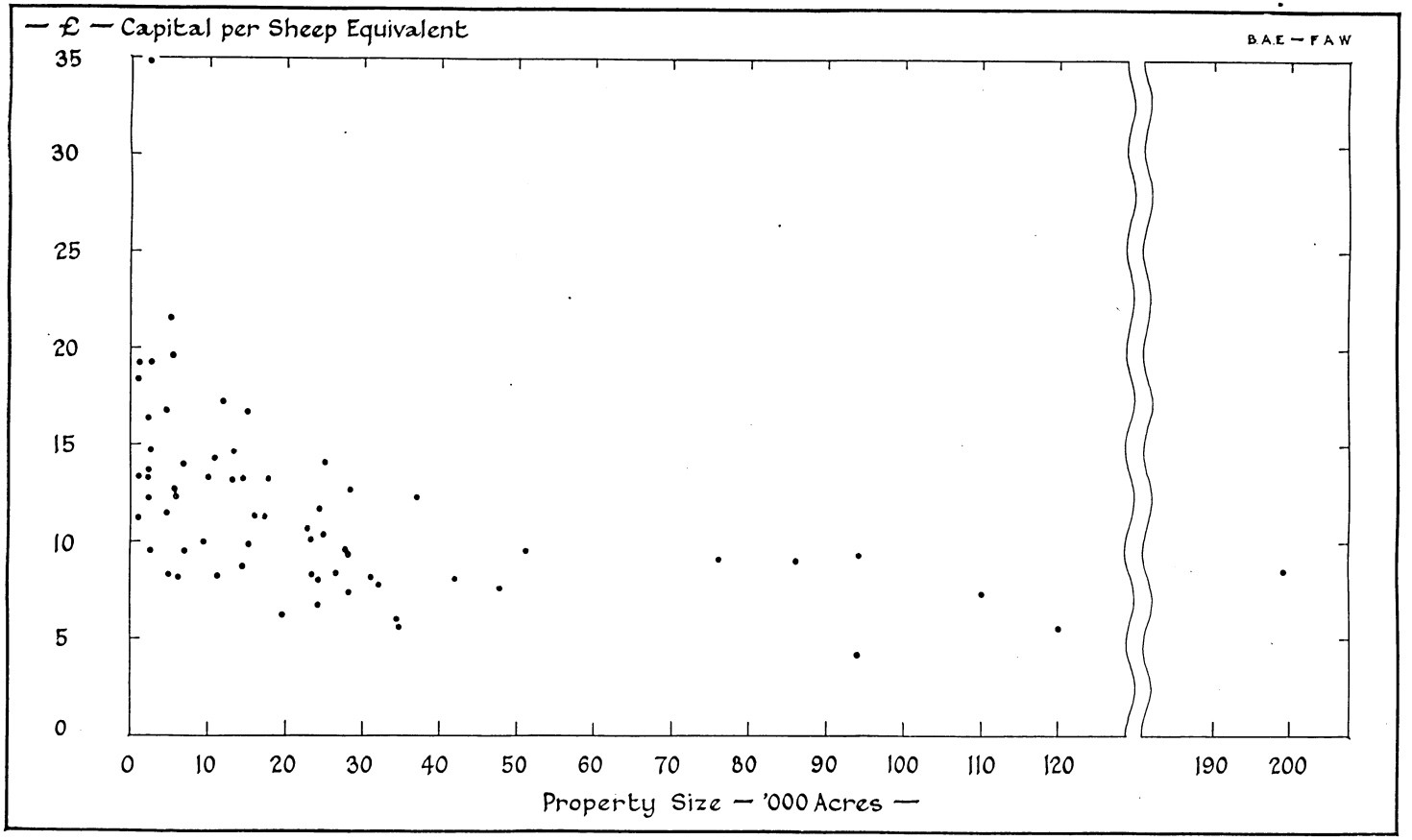
The range of total returns was as shown in Table No. 24.

TABLE No. 24.

FREQUENCY DISTRIBUTION OF RETURNS: SAMPLE PROPERTIES.

Returns	No. of Properties
Loss	1
Under £1,000	—
£1,000 under £2,000	2
£2,000 under £5,000	13
£5,000 under £10,000	16
£10,000 under £20,000	21
£20,000 under £50,000	15
£50,000 and over	2
	70

GRAPH I : PROPERTY SIZE COMPARED WITH CAPITAL PER SHEEP EQUIVALENT : SAMPLE PROPERTIES.
(EXCLUDING SHEEP/CEREAL PROPERTIES.)



The one property with a negative return was a property in the drought area of the North-west on which the loss on sheep and cattle trading exceeded the return from wool.

The returns from various sources according to farm enterprise are shown in Table No. 25.

TABLE No. 25.

AVERAGE RETURNS FROM DIFFERENT SOURCES: BY ENTERPRISES: SAMPLE PROPERTIES.

Source	Sheep only		Sheep-cattle		Sheep-cereal	
	£	%	£	%	£	%
Wool	16,373	92·7	13,746	79·3	3,908	46·8
Sheep A/c and skins	1,039	6·2	1,837	10·9	1,175	19·9
Cereals	—	—	—	—	2,562	28·9
Beef production	180	1·1	1,588	9·8	392	3·8
Other	14	—	1	—	53	0·6
Total	17,606	100·0	17,172	100·0	8,090	100·0

The Sheep-cereal farms included in the survey received about 30 per cent of their gross returns from cereal cropping and less than 50 per cent from wool.

Wool Returns

The gross return for wool per sheep is a function of cut per head and price per lb. The average price received per lb. for the 70 properties was 91·16d., there being little difference between the Wheat-sheep and the Pastoral zones in this factor. This compares with the all-State average of 88·85d. for that year, published by the National Council of Wool Selling Brokers.

The lowest average price recorded was 66·1d. lb. and the highest 112·2d. lb. The average price received per lb. for wool according to sheep enterprise is shown in Table No. 26.

The average returns from wool per sheep shorn for the various types of sheep enterprise are shown in Table No. 27.

TABLE No. 26.

FREQUENCY DISTRIBUTION OF PRICE PER LB. FOR WOOL: BY SHEEP ENTERPRISES.

Price per lb.	Merino: wethers	Merino: breed. replace.	Merino: breed. surplus	Crossbreds with fat lambs	Crossbred wool production	Total
Less than 70d.				1		1
70d. and under 80d.	1	5			2	8
80d. „ „ 90d.	2	13	1			16
90d. „ „ 100d.	2	29	4			35
100d. and over	3	7				10
Total	8	54	5	1	2	70
Average	d. lb. 94·5	d. lb. 90·8	d. lb. 93·9	d. lb. 66·1	d. lb. 78·3	d. lb. 91·16

TABLE No. 27.

FREQUENCY DISTRIBUTION OF RETURNS FROM WOOL PER SHEEP SHORN: BY SHEEP ENTERPRISES.

Return	Merino: wethers	Merino: breed. replace.	Merino: breed. surplus	Crossbreds with fat lambs	Crossbred wool growing	Total
Under £2		4			1	5
£2 and under £2·5	2	3	1	1		7
£2·5 „ „ £3·0	—	10	2		1	13
£3·0 „ „ £3·5		19				19
£3·5 „ „ £4·0	2	12				14
£4·0 „ „ £4·5	1	5	2			8
£4·5 „ „ £5·0	3					3
£5 and over		1				1
Total	8	54	5	1	2	70

The average return from wool per sheep was about £3 6s. 0d., with the majority of the sample falling between £2 10s. 0d. and £4 0s. 0d. The crossbred properties were among the lower groups, along with some of the drought-affected properties.

The average return per sheep from the whole sheep enterprise—that is, allowing for sheep trading as well as wool returns—for the various categories of sheep enterprise was as shown in Table No. 28.

TABLE No. 28.

AVERAGE RETURN PER SHEEP FROM SHEEP ENTERPRISE: SAMPLE PROPERTIES.

Sheep enterprise	Av. return per sheep
	£ s. d.
Merino: wethers	4 6 0
Merino: breeding replacements	3 14 0
Merino: breeding surplus	4 14 0
Crossbred: fat lambs	5 6 0
Crossbred: woolgrowing	2 4 0

It should be pointed out that there was only one fat lamb producer in the sample. Among the other groups there were two breeding replacements, and one wether runner with returns per sheep between £5 10s. 0d. and £6 0s. 0d., while one property breeding and selling surplus young sheep had a return of a little over £6 per sheep.

Beef Returns.

The returns from the beef enterprise were, for the most part, only a small proportion of total returns. Even on those properties classified as sheep-cattle, returns from the beef enterprise were only 9·8 per cent of total returns. The highest figure for any one property was 35·7 per cent.

The average gross price received for sales of cattle from properties in the Wheat-sheep zone was £17 16s. 0d. per head, and from properties in the Pastoral zone £21 10s. 0d. per head.

Cereal Cropping Returns.

Only five of the 20 properties in the Wheat-sheep zone derived income from the sale of wheat. The average return for these five properties from this source was £2,657, or 18·4 per cent of their total returns. One farm had an income from cereals representing 92·7 per cent of total returns, but for the remainder the proportion was less than 40 per cent.

There was one property in the Roma district in the Pastoral zone which derived income from cereal cropping.

More than 99 per cent of the income from cereal cropping was from the sale of wheat, the very small balance being from sales of oats and barley.

COSTS.

The costs shown in Table No. 29 (p. 20) include all cash costs and depreciation. Interest actually paid is shown at the foot of the table but is not included in the structure of costs. Allowances for operator's labour and for interest on total capital are introduced into the analysis at a later stage.

The structure of costs as between the two zones is practically identical. There are so few of the survey properties in the Wheat-sheep zone growing crops that their influence on the cost structure of this zone is barely discernible.

The cost structures of the various types of farm enterprise and sheep enterprise have been examined, and are very similar to that shown in Table No. 29. The exception is the Sheep-cereal cropping enterprise, where fuel, plant maintenance, depreciation and wheat marketing are proportionately heavier items of cost. The difference in the absolute level of costs is a reflection of the different average flock size in the two zones. The range of costs for the 70 properties is shown in Table No. 30.

TABLE No. 30.

FREQUENCY DISTRIBUTION OF COSTS: BY ZONES.

Costs	Wheat-sheep	Pastoral	Queensland
Under £500	—	—	—
£500 and under £1,000	2	2	4
£1,000 „ „ £2,000	3	5	8
£2,000 „ „ £5,000	11	10	21
£5,000 „ „ £10,000	3	20	23
£10,000 „ „ £20,000	1	9	10
£20,000 „ „ £50,000	—	3	3
£50,000 „ „ £100,000	—	1	1
Total	20	50	70
Average	£3,588	£9,036	£7,479

TABLE No. 29.

AVERAGE COSTS AND COST STRUCTURE: BY ZONES: SAMPLE PROPERTIES.

Item	Wheat-sheep zone (20 farms)		Pastoral zone (50 farms)		Queensland (70 farms)	
	£	%	£	%	£	%
Labour						
Wages	664	18·1	1,549	17·1	1,296	17·3
Contracts	372	10·4	264	2·9	295	3·9
Shearing and crutching	264	7·4	1,357	15·0	1,045	14·0
Stores and rations	100	3·1	369	4·1	292	3·9
Total	1,400	39·0	3,539	39·1	2,928	39·1
Materials						
Fuel	209	5·8	448	5·0	380	5·1
Fertiliser	8	0·2	—	—	2	—
Seed	47	1·3	6	0·2	17	0·2
Fodder	40	1·1	204	2·2	157	2·1
Packs, bags, twine	119	3·3	185	2·0	166	2·2
Drenches, dips, etc.	48	1·5	79	0·9	70	1·0
Shearing supplies	7	0·2	14	0·1	12	0·2
Vermin destruction	5	0·1	7	0·1	7	0·1
Maintenance: Plant	249	7·0	430	4·8	379	5·1
Improvements	162	4·5	798	8·8	616	8·2
Total	894	24·9	2,172	24·1	1,807	24·2
Services						
Freight and cartage	70	2·0	264	2·9	209	2·8
Marketing: wool	194	5·4	742	8·2	585	7·8
stock	89	2·5	73	0·8	77	1·0
wheat	34	0·9	—	—	10	0·1
Rates and taxes	158	4·4	331	3·7	282	3·8
Insurance	59	1·7	130	1·4	110	1·5
Droving and agistment	33	0·9	485	5·4	356	4·8
Miscellaneous	122	3·4	268	3·0	226	3·0
Total	759	21·2	2,294	25·4	1,855	24·8
Rent	54	1·5	266	2·9	206	2·8
Depcn. (calculated)	481	13·4	765	8·5	683	9·1
Total costs	3,588	100·0	9,036	100·0	7,479	100·0
Land improv. costs	363	10·1	372	4·1	369	4·9
Interest paid	120		202		179	

Cost Structure.

The cost structure as shown in the table indicates that about 40 per cent of total costs is accounted for by labour, 25 per cent by materials, 25 per cent by services, and the remaining 10 per cent by rent and depreciation.

Labour.

The most important item of cost under the heading Labour is wages paid to permanent and casual labour. The award rate for permanent station hands in 1952-53 was £658 per annum, and on this basis the average number of employees in the Wheat-sheep zone was one man and in the Pastoral zone two men. These figures do not take into account contract or shearing and crutching labour. The average number of sheep handled per labour unit (including the operator) was 765 in the Wheat-sheep zone and 1,556 in the Pastoral zone. The number of sheep handled per labour unit in the sheep-only enterprises was 1,600 and in the sheep-cattle type of enterprise 1,291.

Contracts were a heavier item of costs in the Wheat-sheep zone, due chiefly to the large amount of contract brigalow clearing being undertaken in that area.

Shearing and crutching costs were heavier in the Pastoral zone, averaging 4s. 10d. per sheep shorn, as against 3s. 3d. in the Wheat-sheep zone. This resulted from the owner taking a more active part in the shearing operation in the latter zone. For all Queensland the average cost was about 4s. 6d. per head. On the average, this would cover shearing once and crutching once.

Materials.

The chief items under the heading materials were fuel (petrol, oil, kerosene, etc.) and expenditure on the maintenance of plant and improvements. Expenditure on all other materials was less than 6 per cent of total costs.

Services.

The major item of services was wool marketing expenses. Droving and agistment were next highest, the latter being influenced by drought conditions in the North-west. Rates and taxes (which do not include income tax) were another important item under this head.

The item "Miscellaneous expenses" includes such things as telephone, stationery, accountancy, bank fees, legal expenses, subscriptions to organisations and so on.

Rent.

Rent is a lower proportion of costs in the Wheat-sheep zone where there is more freehold land. Even in the Pastoral zone, where the great proportion of the land is leasehold, rent was only 2·9 per cent of total costs.

Depreciation.

Depreciation has been calculated at standard rates rather than at the concessional rates allowed for income tax purposes. The rates used for the major items were :

Fences—3 per cent.
Buildings—3 per cent.
Water supply—dams and wells, 2½ per cent, bores 7½ per cent, mills 5 per cent.
Vehicles—15 per cent.
Other plant—10 per cent.

Land Improvement Costs.

Land improvement costs, although included in the table under various heads (contracts, seed, etc.) are shown separately at the foot of Table No. 29, as a matter of interest. Such costs are of more significance in the Wheat-sheep zone where, on some properties, a considerable amount of work was being done in clearing land of brigalow scrub.

Interest Paid.

The average amount of interest actually paid per property is shown at the foot of Table No. 29, but is not included in the total cost. Interest is allowed for later in the analysis, when interest on total capital investment is charged. It will be seen that interest payments on the average were reasonably low, being somewhere about 2 per cent of cash costs. If it is assumed that bank rate of interest was paid, the average debt on the Wheat-sheep properties was about £2,500 (on an asset with a market value of some £35,000) while on the Pastoral zone properties the average debt was £4,000 (market value £57,000).

Costs per Sheep—Sheep Only Enterprises.

There were 35 properties in the survey classified as sheep-only properties. These properties received 98·9 per cent of their gross returns from sheep and wool, so that all costs incurred can legitimately be charged to the sheep and wool enterprise.

This group ran an average of 4,779 sheep at a cost (as defined on page 19) of £8,162, or £1 14s. 2d. per head. The range of costs per sheep about this average was very wide, the lowest being 16s. 5d. and the highest £3 6s. 0d.

TABLE No. 31.

FREQUENCY DISTRIBUTION OF COSTS PER SHEEP ON SHEEP-ONLY PROPERTIES.

Costs per Sheep	No. of Properties
Under £1	4
£1 and under £1·5	8
£1·5 „ „ £2·0	18
£2·0 „ „ £2·5	3
£2·5 „ „ £3·0	1
£3·0 „ „ £3·5	1

The property with the highest cost was located in the drought area of the North-west. This property had cut back sheep numbers substantially, but had maintained its normal labour force, so that costs per sheep were unduly inflated.

The wide dispersion about the mean demonstrates the major difficulty associated with endeavours to calculate unit costs of production in the sheep and wool industry, and the unreal nature of any average figure arrived at.

INCOME.

Income can be measured at various levels. The first measure used in this analysis is *farm income*, which is the difference between total returns as shown in Table No. 23 and the costs shown in Table No. 29.

The deduction of a charge against capital, in this case 5 per cent on the total investment, gives a *labour and management income.*

A further measure of income is the *return to capital and management.* That is farm income, less an allowance for the operator's labour, in this case £658 per annum. When this return is expressed as a percentage of capital it gives a rate of return on capital, which is perhaps the best measure for comparing the financial performance of groups of properties undertaking various enterprises, and of widely differing sizes.

TABLE No. 33.

FREQUENCY DISTRIBUTION OF FARM INCOME : BY ZONES.

Farm income	Wheat-sheep	Pastoral	Queensland
Loss	—	3	3
£0 and under £500	—	3	3
£500 „ „ £1,000	2	—	2
£1,000 „ „ £2,000	3	5	8
£2,000 „ „ £5,000	9	6	15
£5,000 „ „ £10,000	6	11	17
£10,000 „ „ £20,000	—	13	13
£20,000 „ „ £50,000	—	8	8
£50,000 „ „ £100,000	—	1	1
Total	20	50	70
Average	3,764	11,459	9,261

TABLE No. 32.

AVERAGE FARM INCOME : BY ENTERPRISES : SAMPLE PROPERTIES.

Item	Sheep only	Sheep-cattle	Sheep-cereal	Merino : weths.	Merino : breedg. replt.	Merino : breed. surp.	C'bred w. growing	Queensland
	£	£	£	£	£	£	£	£
Gross returns	17,606	17,172	8,090	7,571	18,000	24,701	2,559	16,740
Costs	8,172	7,197	4,329	3,742	8,110	9,579	1,373	7,479
Farm income	9,434	9,976	3,761	3,827	9,890	15,122	1,186	9,261
Costs as % of returns	46·4	41·9	53·5	49·4	45·0	38·7	53·6	44·6

Note: Crossbred fat lamb producer not shown ; one property only in this group.

Farm Income.

The average farm income for the 70 properties in the survey was £9,261.

Farm incomes ranged from a loss in three cases, to more than £50,000.

The three properties in the Pastoral zone (Table No. 33) which showed a loss for the year, and one of those which had an income of less than £500, were those most severely affected by drought conditions.

The majority of properties in both zones had an income of more than £2,000.

Table No. 34 shows the distribution of properties by farm income per £1,000 of capital.

TABLE No. 34.

FREQUENCY DISTRIBUTION OF FARM INCOME PER £1,000 OF CAPITAL: BY ZONES.

Farm income per £1,000 of capital	Wheat-sheep	Pastoral	Queensland
Loss	—	3	3
Under £100	9	8	17
£100 and under £200	10	16	26
£200 „ „ £300	—	14	14
£300 „ „ £400	—	8	8
£400 „ „ £500	1	—	1
£500 „ „ £600	—	1	1
Total	20	50	70
Average	£107	£200	£182

Farm Income per Sheep.

The farm income per sheep on the 35 sheep-only properties averaged £1 19s. 5d., but as with costs per sheep for this group, there was a wide range about the average.

TABLE No. 35.

FREQUENCY DISTRIBUTION OF FARM INCOME PER SHEEP ON SHEEP-ONLY PROPERTIES.

Farm income per sheep	No. of Properties
Loss	2
Under £1	4
£1 and under £2	6
£2 „ „ £3	15
£3 „ „ £4	7
£4 and over	1

Labour and Management Income.

The labour and management income is obtained by deducting from farm income a charge against capital. A standard rate of 5 per cent on total capital investment has been taken.

TABLE No. 36.

AVERAGE LABOUR AND MANAGEMENT INCOME: BY ZONES: SAMPLE PROPERTIES.

Item	Wheat-sheep	Pastoral	Queensland
	£	£	£
Gross returns	7,352	20,495	16,740
Less costs	3,588	9,036	7,479
Farm income	3,764	11,459	9,261
Less charge against capital	1,752	2,866	2,548
Labour and management income	2,012	8,593	6,713

The table shows that even after allowance is made for a charge against capital the returns were eminently satisfactory.

The range of labour and management income was as shown in Table No. 37.

Return to Capital and Management.

As an alternative to labour and management income the return to capital and management can be used as a comparison of income. It is obtained by deducting from farm income an allowance for the operator's labour. This has been taken at £658 per annum, the ruling award rate for permanent station labour in 1952-53.

TABLE No. 37.

FREQUENCY DISTRIBUTION OF LABOUR AND MANAGEMENT INCOME: BY ZONES.

Labour and management income	Wheat-sheep	Pastoral	Queensland
Loss	2	7	9
Under £658	3	1	4
£658 and under £1,000	2	3	5
£1,000 „ „ £2,000	4	1	5
£2,000 „ „ £5,000	7	10	17
£5,000 „ „ £10,000	2	14	16
£10,000 „ „ £20,000	—	8	8
£20,000 „ „ £50,000	—	5	5
£50,000 and over	—	1	1
Total	20	50	70
Average	£2,012	£8,593	£6,713

TABLE No. 38.

AVERAGE RETURN TO CAPITAL AND MANAGEMENT: BY ZONES: SAMPLE PROPERTIES.

Item	Wheat-sheep	Pastoral	Queensland
	£	£	£
Gross returns	7,352	20,495	16,740
Less costs	3,588	9,036	7,479
Farm income	3,764	11,459	9,261
Less operator's labour	658	658	658
Return to capital and management	3,106	10,801	8,603

When this level of income is expressed as a percentage of capital, it gives a rate of return to capital and management. The average rate of return to capital and management was 16·9 per cent (Wheat-sheep zone 8·9 per cent, Pastoral zone 18·8 per cent).

The rate of return to capital and management is probably the most appropriate figure to use in a comparison of financial performance of properties of different types and sizes.

The distribution of the rate of return to capital and management is shown in Table No. 39.

TABLE No. 39.

FREQUENCY DISTRIBUTION OF RATE OF RETURN TO CAPITAL AND MANAGEMENT.

Rate of return to capital and management	No. of properties
percentage	
Loss	6
Under 5	7
5 and under 10	15
10 „ „ 15	11
15 „ „ 20	10
20 „ „ 25	9
25 „ „ 30	5
30 „ „ 35	4
35 „ „ 40	2
40 and over	1
Total	70

Those properties with a rate of return to capital and management less than 5 per cent did not earn sufficient income to cover a capital charge of 5 per cent on total investment and an allowance for the operator's labour. There were 13 such properties among the 70 included in the survey.

Six of these can be accounted for immediately by the influence of drought. These properties were located in the North-west and had suffered heavily from drought in the year of the survey.

Two of the remaining properties were in an early stage of development, and their costs included substantial amounts being spent on land clearing. These properties were located on brigalow country.

Three others, two in the Wheat-sheep zone, and one in the Pastoral zone, were very lightly stocked, and for various reasons (chiefly personal) were not using the full potential of their land.

The remaining two were on poor or undeveloped country with light-cutting sheep—one with a heavy infestation of rabbits (since cleared up by myxomatosis) and the other suffering heavy losses from dingoes.

The comparative rates of return for the various types of enterprise were as shown in Table No. 40.

The table indicates that there were some differences in the rate of return to capital and management as between enterprises of different types.

The sheep-only and sheep-cattle enterprises are substantially similar. However, the average rate of return to the Sheep-cereal enterprise was somewhat lower than the average of all properties surveyed. This is a reflection of the higher land values in the wheat areas, and the lesser drought risk involved.

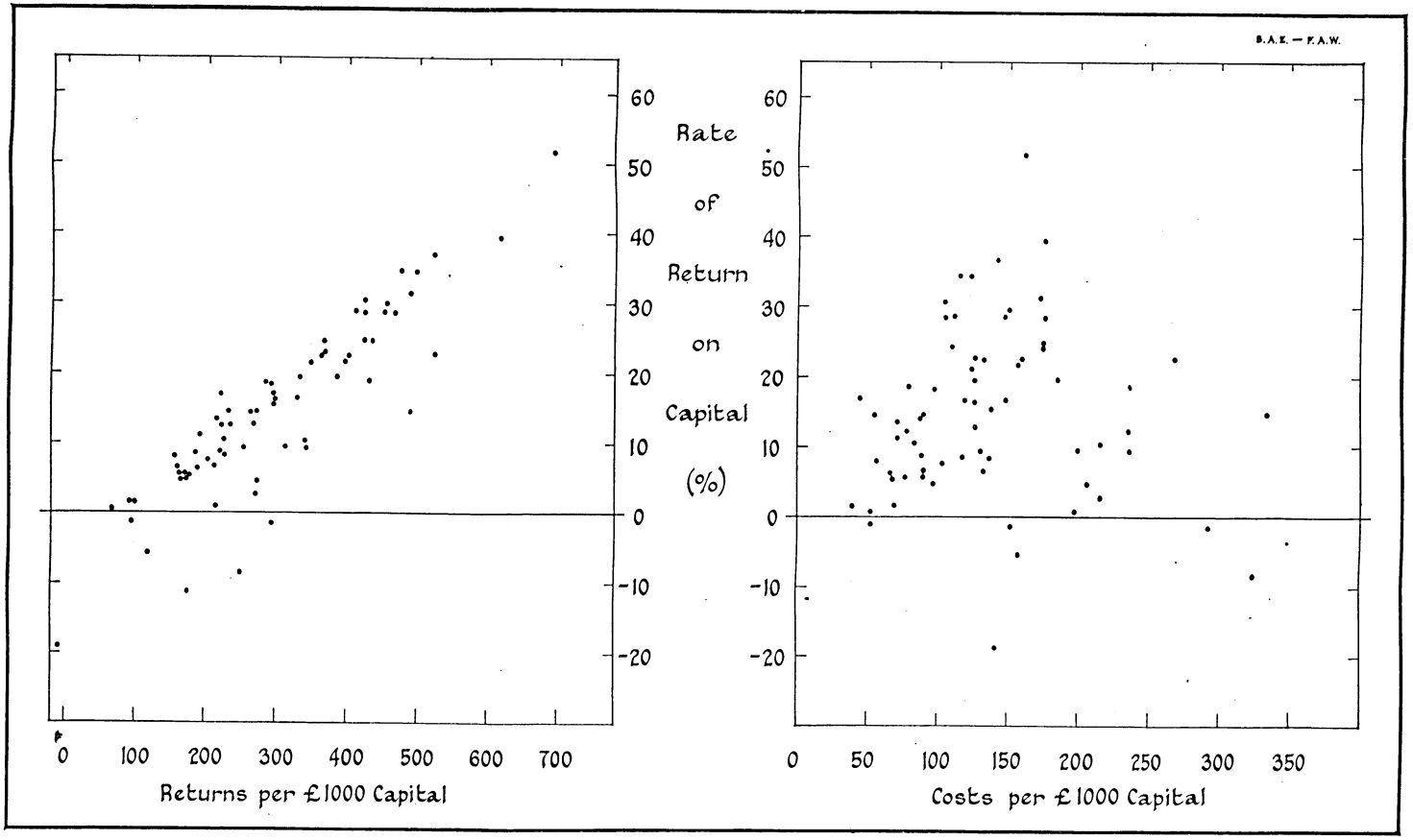
Among the sheep enterprises, the group breeding a surplus of young sheep was outstanding. The crossbred woolgrowers, on the other hand, showed a very low rate of return, but a far larger sample of this type of enterprise would be required before any significant conclusions could be drawn.

TABLE No. 40.

FREQUENCY DISTRIBUTION OF RATE OF RETURN TO CAPITAL AND MANAGEMENT: BY ENTERPRISES AND SHEEP ENTERPRISES.

	Enterprise			Sheep enterprise				
Rate of return to Capital & Management	Sheep only	Sheep-cattle	Sheep-cereal	Merino: weths	Merino: breed. replmt.	Merino: breed. surp.	XB fat lamb	XB wool
percentage								
Loss	3	3		1	4			1
Under 5	2	4	1	1	6			
5 and under 10	6	6	3	2	10	1	1	1
10 „ „ 15	6	5		2	8	1		
15 „ „ 20	4	5	1		9	1		
20 „ „ 25	6	3			8	1		
25 „ „ 30	3	2			5			
30 „ „ 35	3	1		1	2	1		
35 „ „ 40	2			1	1			
Over 40		1			1			
Total	35	30	5	8	54	5	1	2
Average percentage	17·8	16·7	8·7	11·2	16·9	23·0	8·5	1·7

GRAPH II : RATE OF RETURN ON CAPITAL COMPARED WITH GROSS RETURNS AND WITH COSTS : PER £1000 CAPITAL : SAMPLE PROPERTIES.



The effects of many factors on the rate of return were studied. These included farm size, flock size, lambing percentage, total capitalization, costs per £1,000 of capital, returns per £1,000 of capital, cut per head, return per sheep from the sheep enterprise, costs as a percentage of returns, farm income per labour unit, and the ratio of cattle to sheep.

Both farm size and flock size showed a positive correlation with rate of return. However, most of the big flocks were in the more remote parts of the State where land values are low. In the year of the survey these areas experienced a good season, with the exception of those located in the North-west. The relatively lower land values of these properties is a reflection of the greater drought risk in these areas, and also of the general disabilities of life in remote areas. In a good season the return on capital in such areas is above that of safe areas, but provision must be made in those good years for the inevitable losses incurred in frequently occurring droughts.

The most significant correlation was that with gross returns per £1,000 of capital. The coefficient of correlation was +·84. The factors which affect returns, such as cuts per head, lambing percentage and price per pound of wool, all showed positive relationships with the rate of return on capital but none as significant as gross returns per £1,000 of capital.

On the other hand, the relationship between costs per £1,000 of capital and the rate of return on capital was not significant.

Stated plainly, those properties with a high level of gross returns per £1,000 of capital tended to have a high rate of return on capital. Those with a low level of gross returns per £1,000 of capital also tended to have a low rate of return on capital.

On the other hand, some properties with a high level of costs per £1,000 of capital still had a high rate of return on capital, while some with a low level of costs per £1,000 of capital still had a low rate of return on capital.

The conclusion which emerges is that the level of gross returns per £1,000 of capital is a far more important determinant of profitability than is the level of costs per £1,000 of capital. This is illustrated in Graph II.

Among the factors affecting returns, cut per head showed the most significant correlation. Apart from those properties which were grossly understocked, properties with heavy cutting sheep generally had a high rate of return on capital. In Queensland, where sheep are grazed almost solely on natural pastures, seasonal conditions are perhaps the most important factor in productivity. A further problem in the drier areas of Queensland is that of maintaining flock numbers with generally low lambings. Property owners are obliged to keep a high proportion of ewes, and a too high proportion of aged ewes and other sheep. This leads to low average cuts per head, as well as to poorer quality wool.

These problems, together with that of drought, have long been recognised as major sources of economic loss to the Queensland sheep and wool industry. The Queensland Department of Agriculture and Stock is directing a good deal of its research and extension activities on sheep and wool towards the amelioration of these problems. This has included work on the selection of sheep by fleece measurement; fertility of rams in a tropical environment, times of mating and lambing, etc.

A further development of considerable economic significance in Queensland is the clearing of brigalow lands for cropping and more intensive animal husbandry. Several of the properties in the survey had commenced such a programme, but were in such early stages of development that a study of the returns from their investment was not possible. However, all survey properties have been revisited in late 1955, and the financial results of this particular group in later years should yield valuable information on the economics of brigalow land development.

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