# THE GRAZING INDUSTRY IN THE SOUTH-WEST SLOPES*

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This article is based on information obtained from a survey of grazing properties in the Shires of Gundagai, Tumut, Tumbarumba, Kyeamba and Holbrook. All these shires fall within the Statistical Division of the South-West Slopes, and form the eastern portion of the Southern Agricultural Region. The principal aim of the survey, which was carried out at the request of the Southern Agricultural Regional Advisory Committee, was to make an assessment of the potential for increased production in these shires. This and other aspects of the survey will be dealt with in later articles. The present article is quite limited in scope, being concerned solely wtih the description of the grazing enterprises included in the survey sample, and of the stock management practices in use on them. It is intended to serve as an introduction to, and provide a background for the later articles in this series.

* The authors wish to thank Mr. R. C. Madsen, Regional Supervisor of Agriculture, and the other officers of the Southern Agricultural Region for their advice and assistance in the planning and execution of the survey.

The Rural Bank of New South Wales made available two of its officers to assist in carrying out the field work of the survey. It is desired to thank the Bank for its generosity in this matter, and to express appreciation of the valuable assistance given by the officers concerned, Messrs. R. W. Norman and E. L. Dunn, without which a survey of such scope could not have been carried out.

Finally, thanks are due to the 150 graziers who willingly supplied the information on which this survey is based.

## THE SURVEY AREA.

The survey area includes the greater part of the eastern grazing districts of the Southern Agricultural Region. The shires of Demondrille and Boorowa also lie in this portion of the region, but they were not covered by the survey because it was thought better, with the resources available, to sample an adequate proportion of a smaller area than a possibly inadequate proportion of a larger area.

The area covered by the survey is shown in the accompanying map (Fig. 1). It comprises the whole of Gundagai and Holbrook Shires, "A" and "B" ridings of Tumbarumba Shire, "A" and "C" ridings of Tumut Shire, and "C" riding of Kyeamba Shire. The ridings of Tumut and Tumbarumba Shires which were excluded consist almost entirely of rough mountainous country, and contribute little to the production of the region. "A" and "B" ridings of Kyeamba Shire were excluded because their predominant form of land use is mixed wheat-sheep farming.

### Topography.[1]

The south-eastern portion of the survey area consists of part of Tumbarumba Shire. This shire is well elevated and includes part of the Kosciusko foothills. Most of the country is from 1,500 to 3,000 feet above sea level, and part of it is extremely rough. Much, however, is of the undulating plateau type, and there are some rich valleys. It provides the focus of the drainage system of the area, streams flowing south and south-west to join the Murray, and north and north-west to meet the Murrumbidgee.

Topographical contrasts are greatest in Tumut Shire, which is dissected by the Tumut, Gilmore, Goobragandra and Adelong valleys. These are very fertile and have an elevation of approximately 1,000 feet. Rising away from the valleys to heights of 3,000 feet and more are very hard forest covered hills. There are also some rich plateaux at about 2,500 to 3,000 feet, the one at Batlow being devoted mainly to fruit growing.

Holbrook Shire and "C" riding of Kyeamba Shire are similar in land form. They consist mainly of level and undulating country, but the land rises and becomes very hilly towards the south and the east, where they border Tumbarumba and Tumut Shires. The elevation varies from about 900 feet along watercourses in their western portions, to over 3,000 feet in places near their eastern and southern boundaries.

The Murrumbidgee River flows through Gundagai Shire, and along its banks, and those of its tributaries, are found rich flats. Elsewhere the country ranges from gently undulating to very hilly.

The differing topographies of the various shires (or those portions of them included in the survey area) are reflected in Table I which summarizes the topography of the properties included in the survey sample. It will be noted that properties in Tumut Shire have the lowest proportion of level to undulating land and the highest proportion of very steep land, while the converse situation holds for properties in Holbrook Shire.

[1] The authors are indebted to Mr. R. D. Eastoe, District Livestock Officer (Sheep and Wool), for assistance in the preparation of these notes.

TABLE I.

*Distribution of Land Types on Survey Properties.*

| Shire. | Land Type (approximate degree of slope). | | |
|---|---|---|---|
| | Less than 8°. | 8-20° | Greater than 20° |
| | Per cent. | Per cent. | Per cent. |
| Tumut ... ... ... ... | 12 | 57 | 31 |
| Tumbarumba ... ... ... | 40 | 41 | 19 |
| Gundagai ... ... ... | 26 | 52 | 22 |
| Kyeamba ... ... ... | 28 | 59 | 13 |
| Holbrook ... ... ... | 54 | 39 | 7 |
| Whole Region ... ... ... | 31 | 50 | 19 |

**Rainfall.**

The average annual rainfall pattern follows the topographical pattern, the highest rainfall being recorded in the areas of greatest elevation. Rainfall thus tends to be highest in the south-eastern portion, and lowest in the north-western part of the survey area. This tendency is shown schematically in Fig. 2, which gives the average annual rainfall for

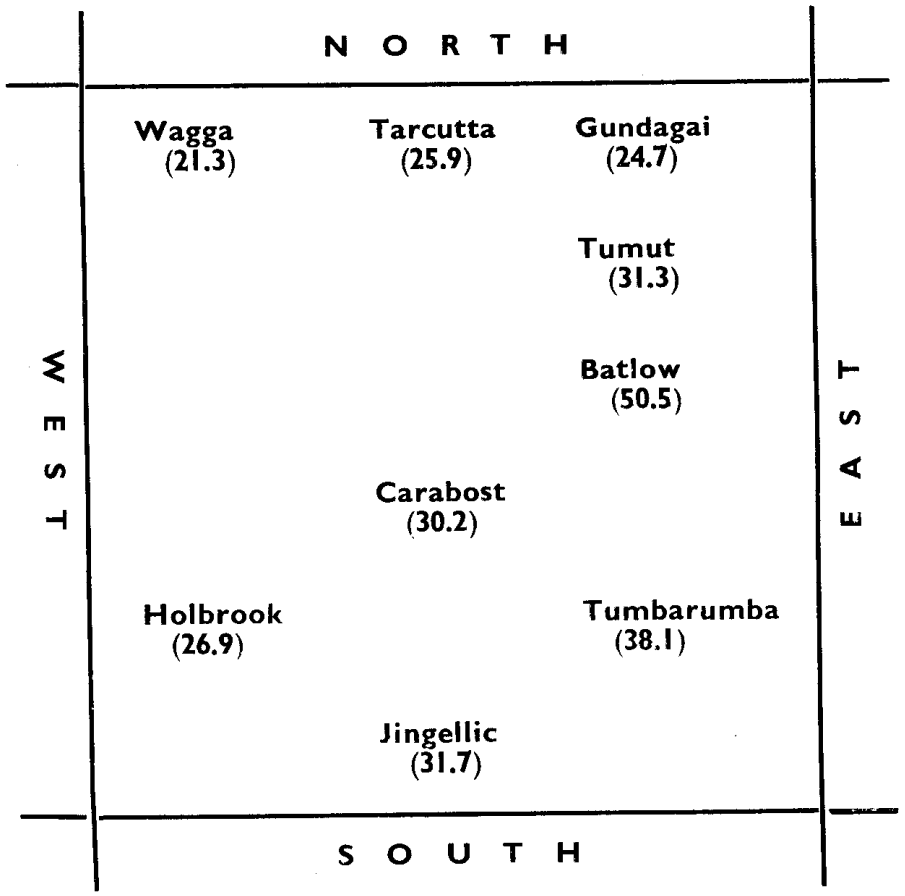


**Fig. 2. Average annual rainfall (in inches) at selected stations within or adjacent to the survey area. The stations have been arranged according to their approximate geographical location. (Source:** *Results of Rainfall Observations made in New South Wales, Sections I-VI.* **Commonwealth Bureau of Meteorology, 1948.)**

selected stations within or adjacent to the survey area. In general the rainfall is fairly well distributed throughout the year, with a winter maximum.

**Sampling Method.**

In the course of the survey information was collected from the operators of 150 properties. These properties were selected at random from the shire rate books, and represent a 16.7 per cent. sample (or one in every six) of properties in the area. Before being included in the survey sample, however, a property had to meet the following criteria:—

(*a*) *Either* an area of 500 acres, *or* a stocking rate of 500 dry sheep (or their equivalent).

(*b*) Seventy-five per cent. of the operator's income to be derived from the sheep and cattle enterprises (excluding dairying).

If criterion (*b*) is accepted as a reasonable definition of a grazing property, the survey sample represents a random sample of grazing properties of greater size than the specified minimum. (In fact, for all practical purposes the sample may be regarded as a random sample of grazing properties, as very few properties which satisfy criterion (*b*) fail to satisfy criterion (*a*).)

The number and proportion of properties chosen from different shires is set out in Table II.

## 2. THE PROPERTIES.

The 150 survey properties embrace a total area of 297,663 acres, and give full-time employment to a permanent labour force of 340 men. Approximately 351,446 sheep, 18,526 beef cattle, and 1,582 other stock are depastured on the properties. The "average" property occupies an area of almost 2,000 acres, employs two or three men, and runs approximately 3,000 dry sheep (or their equivalent).

Such average figures are of little use in describing the survey properties, however, as they mask the tremendous variations in size and scale of operations of properties in the area. They range in area from 399 acres to over 22,000 acres, in flock and herd size from 315 to 33,000 sheep equivalents[2] and in labour force from one man to fourteen men.

TABLE II.

*Location of Survey Properties.*

| | Shire. | | | | | |
|---|---|---|---|---|---|---|
| | Tumbarumba. | Kyeamba. | Tumut. | Holbrook. | Gundagai. | Region. |
| Number of Properties ... | 27 | 26 | 27 | 36 | 34 | 150 |
| Percentage of Properties ... | 18 | 17 | 18 | 24 | 23 | 100 |

[2] For an explanation of this term, see page 72.

Figures 3, 4, and 5 which classify the properties according to area, number of stock carried and permanent labour force, reveal the distribution of properties within the ranges just quoted. They clearly show the great numerical preponderance of the smaller and medium-sized properties: in contrast with the "average" property, the "modal" property has an area of between 1,000 and 2,000 acres, carries between 1,000 and 2,000 sheep and is operated by one man only. Further, 91 per cent. of the holdings are less than 5,000 acres in area, 82 per cent. carry less than 5,000 stock equivalents, and 93 per cent. employ less than five men. Thus the great majority of holdings fall within fairly narrow size limits and consequently form a reasonably homogeneous group for purposes of description and analysis. The bulk of the properties, are, in fact, family-size enterprises; only a small minority are

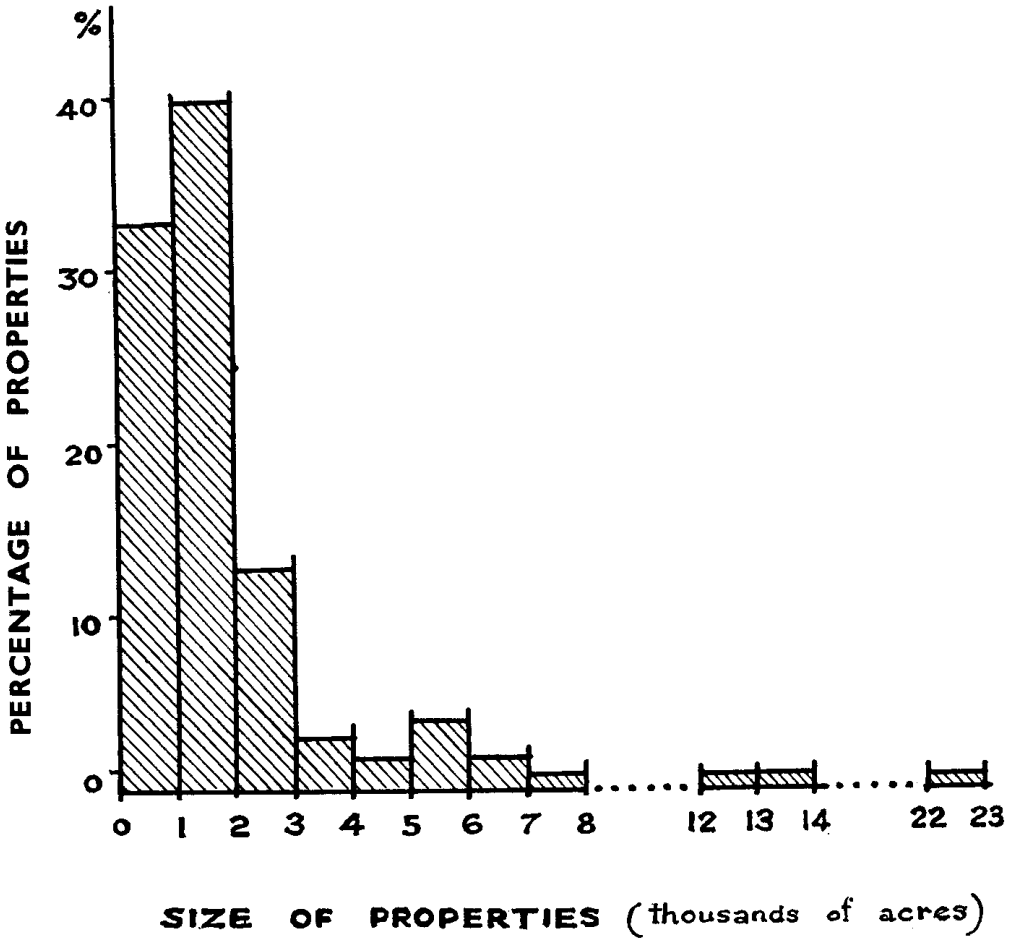


**Fig. 3. Distribution of properties by area. Note the heavy concentration of properties in the two lowest area classes, and the long discontinuous "tail" formed by a few large properties.**

large station properties. The preponderance of the former is clearly shown in Table III: almost 60 per cent. of the graziers employ no permanent non-family labour, and a further 20 per cent. employ one permanent man only.

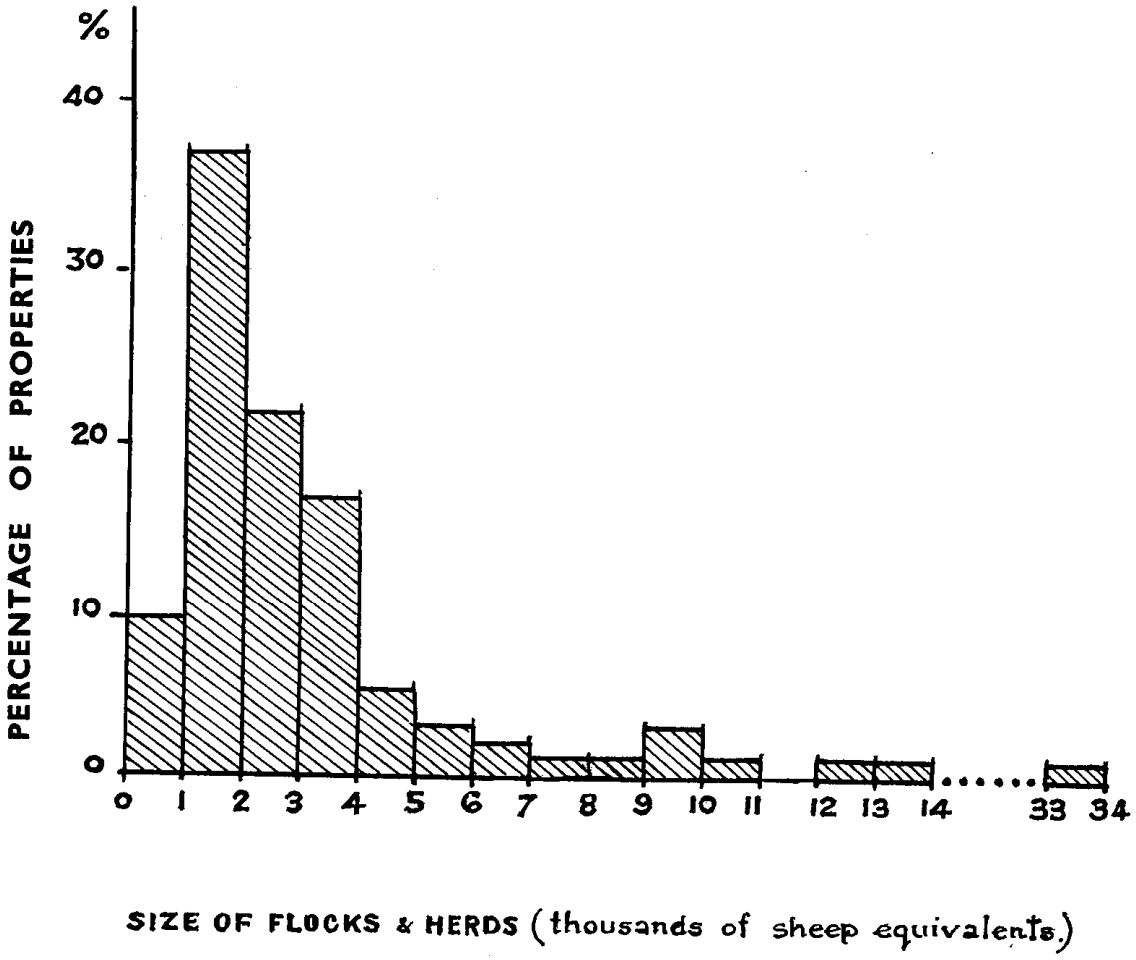


**Fig. 4. Distribution of properties by zock and herd size. Note that this distribution has a somewhat more even spread than the distribution of properties by area.**

The distinction between family and non-family labour assumes an added significance when it is realized that the majority of family workers share the responsibilities and rewards of ownership, by means of partnership arrangements. Sixty relatives of the graziers interviewed were employed on or had an interest in the survey properties; forty-one of them were members of partnerships, receiving a share of profits as remuneration, and nineteen were employed for wages (many of the latter were the young sons of owners). There were fifteen father-son(s) partnerships, ten brother-brother(s) partnerships and six more complex types of family partnerships.

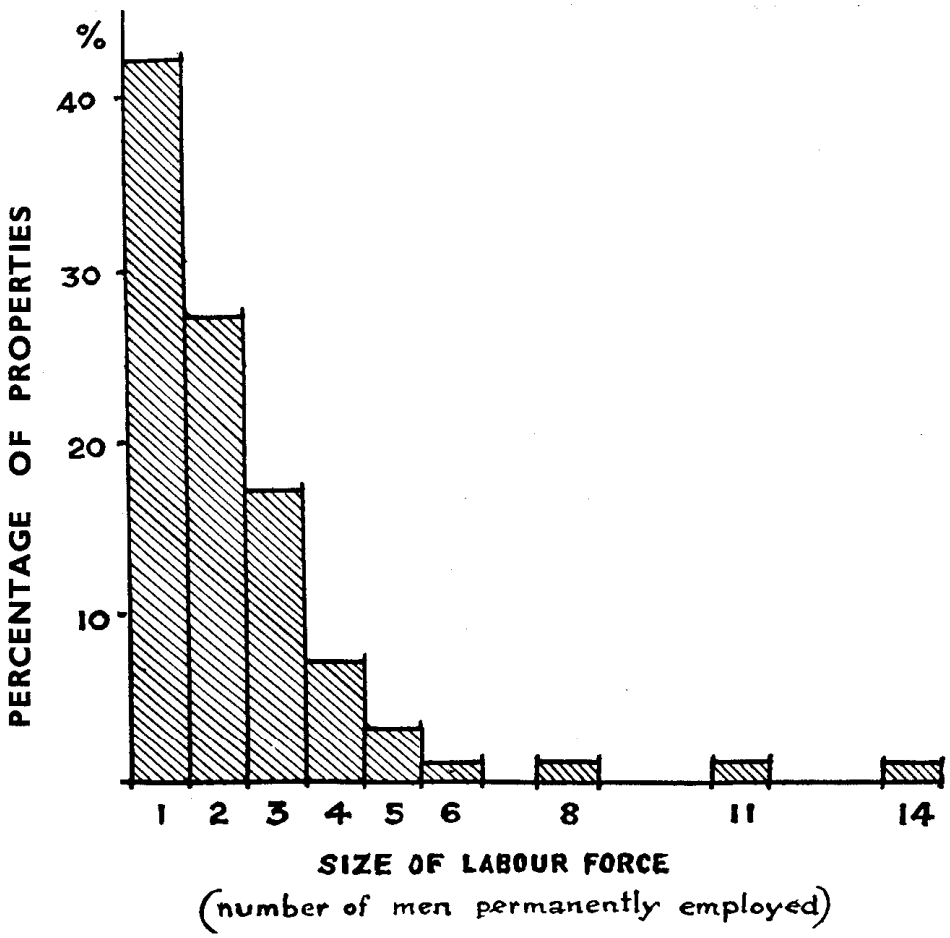


**Fig. 5. Distribution of properties by size of permanent labour force. Note the preponderance of one-man properties.**

Although the large station-type properties are comparatively unimportant numerically, they are of major importance in terms of the land, labour and capital that they employ and the contribution they make to total production on the area. This is brought out in Table IV, which shows the proportion of total resources employed on "one-man", "two", "three", "four", and "five-or-more-men properties". The latter group may be regarded as being roughly co-extensive with large station properties. It will be observed that whereas this group constitutes only 7 per cent. of the total sample, it accounts for 27 per cent. of the total area of survey properties, for 26 per cent. of the total number of stock carried, and for 24 per cent. of the total labour force. Furthermore, these 7 per cent. of properties employ slightly more land and labour, and carry more stock, than the 42 per cent. of properties constituting the "one-man properties" group.

TABLE III.

*Size and Composition of Labour Force on Survey Properties.*

| Number of Non-Family Employees. | Total Permanent Labour Force. | | | | | Total. | Percentage of all Properties. |
|---|---|---|---|---|---|---|---|
| | 1 man. | 2 men. | 3 men. | 4 men. | 5 or more men. | | |
| | Number of Properties. | | | | | | Per cent. |
| 0 | 59 | 16 | 9 | ... | 1 | 85 | 58 |
| 1 | 2 | 24 | 6 | 1 | ... | 33 | 22 |
| 2 | ... | ... | 10 | 3 | 1 | 14 | 10 |
| 3 | ... | ... | ... | 6 | ... | 6 | 4 |
| 4 | ... | ... | ... | ... | 3 | 3 | 2 |
| 5 or more | ... | ... | ... | ... | 6 | 6 | 4 |
| Total ... | 61 | 40 | 25 | 10 | 11 | 147* | 100 |

* Precise information not available for three properties.

TABLE IV.

*Properties Classified by Permanent Labour Force.*
*Relative Importance of Each Type.*

| Characteristic. | Type of Property. (Number of Permanent Employees per Property.) | | | | |
|---|---|---|---|---|---|
| | 1 man. | 2 men. | 3 men. | 4 men. | 5 or more men. |
| | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. |
| Total Number of Properties | 42 | 27 | 17 | 7 | 7 |
| Total Labour Force ... | 18 | 24 | 22 | 12 | 24 |
| Total Non-Family Labour Force | 2 | 17 | 19 | 18 | 44 |
| Total Area ... ... | 27 | 17 | 19 | 10 | 27 |
| Total Stock ... ... | 22 | 22 | 19 | 11 | 26 |

Further comparisons between the different groups of properties (when classified by permanent labour force) are made in Table V. The most interesting facts to emerge from this table are:—

(i) The one-man properties are the least intensively utilized. They have the highest average area per man, and the lowest average number of stock per acre. Two possible explanations of this result are put forward. First, the survey sample contains a large number of soldier settlers, most of whose properties fall within the one-man category. These properties, being recently sub-divided, are in many cases less highly developed and improved than the average. (Table V shows that the average period of establishment of operators of one-man properties is considerably less than that of other graziers.) Second, the one-man group contains a number of properties whose owners are relatively advanced in years. Incapacity or eccentricity on the part of the operator has its most serious effects where he is the only operator.

(ii) The average area of two-men properties is no larger than that of one-man holdings. Part of this result is explained by the fact that some of the one-man enterprises are relatively undeveloped, and

TABLE V.

*Characteristics of Different Types of Property (Properties Classified by Permanent Labour Force).*

| Characteristic. | Type of Property. (Number of Permanent Employees per Property.) | | | | | |
|---|---|---|---|---|---|---|
| | 1 man. | 2 men. | 3 men. | 4 men. | 5 or more men. | All Properties. |
| Average Area (acres)... | 1,232 | 1,230 | 2,231 | 2,652 | 6,958 | 1,911 |
| Average Flock and Herd Size* ... ... | 1,676 | 2,493 | 3,587 | 4,974 | 10,933 | 3,093 |
| Average Area per man (Acres) ... ... | 1,232 | 615 | 744 | 663 | 957 | 836 |
| Average Number of Stock per man* ... | 1,676 | 1,247 | 1,196 | 1,244 | 1,503 | 1,353 |
| Average Number of Stock per acre* ... | 1·3 | 1·9 | 1·6 | 1·9 | 1·6 | 1·6 |
| Percentages of Beef Cattle in Total Stock* | 17 | 22 | 26 | 22 | 34 | 23 |
| Average Period of Establishment (years) | 9 | 15 | 17 | 20 | 28 | 14 |

* Stock in terms of sheep equivalents (see page 72).

will, in time, employ more than one man. It should be noted that one- and two-men properties do not differ nearly so much in terms of stock per man, as in acres per man.

(iii) If one-man properties be disregarded, the other categories do not show much variation in area per man, sheep per man or sheep per acre.

(iv) The large station-type properties employing five or more men do not appear to run fewer stock per acre than the smaller properties. They run more stock per man than do all the other groups except the one-man group but this stock is composed of a higher proportion of beef cattle, which do not require the same amount of attention as sheep.

## 3. THE GRAZIERS.

In addition to data relating to their properties, some personal information about the graziers themselves was recorded. Information was sought concerning their background (in very general terms, *e.g.*, rural or non-rural), their education, the range of their vocational experience prior to taking over their present properties, how and when they acquired their properties, and their age. Facts such as these are useful primarily as an aid to understanding an individual's attitudes, aims, problems and policies, but a general description, in these terms, of the survey graziers will, it is hoped, be of some interest, particularly to extension officers.

### Time of Establishment.

The most noteworthy fact revealed in Table VI is the high proportion of recently established graziers included in the survey sample: 64 per cent. of those interviewed took over their present properties in the war

and post-war years[3] and no less than 20 per cent. were established in the last five years. This substantial infusion of new owners is likely to be of considerable significance and is discussed in some detail below.

**Method of Establishment.**

*Soldier Settlement.*

Table VII shows that more than a third of these newly-established men are soldier settlers.[4] They constitute a distinctive and highly interesting group who enjoy a number of advantages over the ordinary

TABLE VI.

*Graziers Classified by Time of Establishment on Their Present Properties.*

| | When Established. | | | | | |
|---|---|---|---|---|---|---|
| | Before 1920. | 1920–1929. | 1930–1939. | 1940–1949. | 1950 and later. | Not known. |
| Number of Graziers ... | 14 | 15 | 20 | 53 | 43 | 5 |
| Percentage of Graziers ... | 9 | 10 | 14 | 35 | 29 | 3 |

TABLE VII.

*Graziers Established Since* 1940: *Method of Establishment.*

| Principal Method of Establishment.* | Number of Graziers. | Percentage of Graziers. |
|---|---|---|
| 1. War Service Land Settlement ... ... ... | 36 | 38 |
| 2. Private Purchase from (*a*) Non-Relatives ... ... | 27 | 28 |
| (*b*) Relatives... ... ... | 11 | 11 |
| (*c*) Unknown ... ... | 2 | 2 |
| 3. Inheritance or Gift ... ... ... ... ... | 13 | 14 |
| 4. Leasing ... ... ... ... ... ... ... | 3 | 3 |
| 5. Employed as Manager ... ... ... ... | 3 | 3 |
| 6. Partnership Formation ... ... ... ... | 1 | 1 |
| Total ... ... ... ... | 96 | 100 |

*Some graziers have acquired different portions of their properties by different means.

[3] The separation of graziers into two main groups, *i.e.*, those established in pre-war, and those established in war and post-war years is justified on the grounds that the social and economic climate of those two periods were in marked contrast to one another. Evidence was obtained in another survey that farmers established in post-war years were more inclined to adopt new farm practices than were farmers established in the pre-war period. See Ross Parish, "Innovation and Enterprise in Wheat Farming", this *Review* Vol. 22, No. 3. (September, 1954), p. 211.

[4] The high proportion of soldier settlers in the sample gave rise to the suspicion that the sample was biassed in this regard. However, since it is known that at least 173 ex-servicemen have been settled in the area under the War Service Land Settlement Scheme (*War Service Land Settlement in New South Wales; Progress to 31st December,* 1953. Department of Lands, Sydney, 1954) their representation in the sample appears to be not unduly high; ideally there should have been twenty-nine soldier settlers included, not thirty-six.

graziers (*e.g.*, they can secure credit on generous terms) but who are at a disadvantage in other respects, notably in the matter of securing loans through normal commercial channels. But their main interest lies in the fact that they have gained the status of independent operator by ballot, rather than by inheritance or through the selective mechanism of the economy, so that much interest attaches to a comparison of their performance with that of other graziers. It is not proposed to attempt such a comparison in the present article, but merely to discuss certain consequences of their large representation in the survey sample.

Since they have been recently established on newly sub-divided properties, many soldier settlers' properties are as yet relatively undeveloped. As has been pointed out, this probably accounts, in large degree, for the fact that the stocking rate per acre on one-man farms is below average.

Soldier settlers constitute the major group of newcomers to the area. Immigrants to a district are likely to be more receptive to the views of extension officers because, lacking practical experience in the new district, they are more in need of advice, *and also are more likely to admit that they need advice,* than local inhabitants. Furthermore, following the practice of their home districts newcomers might be expected to introduce new techniques of production, or emphasize aspects of management that are neglected by residents of long standing. For example, the fourteen soldier settlers whose previous rural experience was gained in wheat-sheep districts might be expected to place emphasis on the use of superphosphate and on fodder conservation because of their familiarity with these techniques.

*Other Methods.*

In any study of the "normal" constitution of the population of the survey area, or the rate of turn-over of properties, soldier settlement has, of course, to be disregarded. If it is, the proportion of graziers established since 1940 falls from 64 per cent. to 53 per cent.

Of the sixty changes in ownership or management of properties which occurred in the period, twenty-eight, or approximately half, involved members of only one family (thirteen cases of inheritance or gift, eleven of purchase from relatives, three of leasing from relatives, and one of partnership formation between relatives). Twenty-seven properties were purchased by persons unrelated to the vendor, and three salaried managers were employed. Eighteen of these thirty new operators came from outside the survey districts.

**Age of Operators.**

As Table VIII shows, the high proportion of recently-established graziers in the sample is matched by a high proportion falling into the under-50 age groups. The percentage of operators in the 30-40 age bracket is higher than that found in other surveys conducted by this Division and reflects the numerical importance of soldier settlers, many of whom belong to this age group. (It should be noted that, in the case of partnership-operated properties only the age of the person interviewed has been used to compile Table VIII, and since in most cases he was the senior partner, these figures are biassed in favour of the higher age groups.)

TABLE VIII.

*Age of Survey Graziers.*

| | Age (years). | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 20–29. | 30–39. | 40–49. | 50–59. | 60–69. | 70–79. | 80–89. | Not Known. |
| Number of Graziers ... | 8 | 46 | 43 | 24 | 21 | 3 | 2 | 3 |
| Percentage of Graziers | 5 | 31 | 29 | 16 | 14 | 2 | 1 | 2 |

**Background, Experience and Education.**

The background and experience of most of the graziers who were interviewed can be described under a small number of headings.

(i) Largest in numbers, but smallest in range of experience, are those who are the sons of farmers and graziers, and who worked on their parents' properties before commencing grazing on their own account. This group contains sixty-three graziers, twenty-three of whom had spent all of their lives on the same property (*i.e.*, they had acquired all or portion of their parents' property).

(ii) The second largest group (twenty-five graziers) consists of those whose rural experience is identical with that of the first group (*i.e.*, restricted to their parents' properties) but who had also undertaken war service.

(iii) Five men had been engaged in rural labouring, usually of a varied kind (*e.g.*, shearing, fencing, general farm work, etc.) before acquiring their present holdings.

(iv) Ten graziers had been rural labourers before joining the services during the war and had since acquired their own properties.

(v) Nine operators, in addition to working on their parents' properties, had been employed for some period in town or city in such capacities as skilled or unskilled labourer or office worker.

(vi) Another nine graziers mentioned that they had spent some time jackerooing prior to becoming property owners. Whether they were of farm or non-farm background is not clear in all cases. They have been placed in a separate category because jackerooing, in contrast to, say, farm labouring, provides an apprenticeship to property management. Furthermore, in education and social background, they are more akin to members of the next group (vii), than to members of the preceding groups.

(vii) Fifteen graziers, mainly of non-farm background, had been in business, in the professions or in "white collar" employment before acquiring their present holdings. Most had also had some previous experience on the land, or had been employed in business or professions associated with the rural industries, e.g., in wool firms.

(viii) There is a final group of fourteen men for whom information is not available, or whose pattern of experience does not fit into any of the categories just described. Five of these were of rural background, three of them from overseas.

The question of background and experience has been treated in some detail because it is considered that it is of value in predicting the response of graziers to extension recommendations, and in deciding the most appropriate forms for extension activities to take. It is plausible to assume that the wider the range of a person's experience, the more alive is he likely to be to the possibilities of introducing new techniques of production. The most important fact demonstrated by the classification just presented is the large number of operators whose range of experience has been very limited. This impression is heightened when graziers' experience is considered in relation to their education (see Table IX). It will be observed that, in general, those whose range of experience has been narrowest have also received least education: the proportion of graziers who have received only primary school

TABLE IX.

*Experience and Education of Survey Graziers.*

| Experience. | | Education. | | | | Total. |
|---|---|---|---|---|---|---|
| Rural. | Non-Rural. | Primary. | Secondary. | Tertiary. | Not Known. | |
| | | Number of Graziers. | | | | |
| On parents' property. | None ... ... | 43 | 18 | ... | 2 | 63 |
| Labouring ... | None ... ... | 5 | ... | ... | ... | 5 |
| | | 48 | 18 | ... | 2 | 68 |
| On parents' property. | War Service only | 13 | 9 | 1 | 2 | 25 |
| Labouring ... | War Service only | 7 | 3 | ... | ... | 10 |
| On parents' property. | Town or city employment. | 2 | 6 | ... | 1 | 9 |
| | | 22 | 18 | 1 | 3 | 44 |
| Jackerooing ... | In some cases ... | 1 | 7 | 1 | ... | 9 |
| Various ... | Business, professional, "white collar." | 1 | 10 | 3 | 1 | 15 |
| | | 2 | 17 | 4 | 1 | 24 |
| Other ... ... ... ... | | 5 | 2 | ... | ... | 7 |
| Not known ... ... ... ... | | 3 | 2 | ... | 2 | 7 |
| | | 8 | 4 | ... | 2 | 14 |
| Total ... ... ... | | 80 | 57 | 5 | 8 | 150 |

education rises from 8 per cent. among the "jackerooing" and the "business, professional and white collar" categories to 50 per cent. among those who have had limited non-farm, or war service experience, to 71 per cent. among those who have spent all their lives on the land.

TABLE X.

*Education of Survey Graziers.*

| | Education Received. | | | | | |
|---|---|---|---|---|---|---|
| | None. | Primary. | Secondary. | Agric. College. | University. | Not Known. |
| Number of Graziers ... | 1 | 79 | 57 | 3 | 2 | 8 |
| Percentage of Graziers | 1 | 53 | 38 | 2 | 1 | 5 |

## 4. THE LIVESTOCK.

Information was collected concerning the numbers and breeds of stock carried, and the stock management practices in use on the survey farms. To ensure reasonable comparability of the data, sheep numbers as at shearing, 1954, were recorded. (In the survey area, shearing is almost universally carried out in the spring). In the case of fat-lamb producers, the number of lambs sold prior to shearing was also ascertained. With other stock, no such convenient reference point is available, so that the numbers recorded describe the situation existing at the time of interview.

As was pointed out earlier in this article, the total stock population of the survey properties consists of 351,446 sheep, 18,526 beef cattle and 1,582 horses and dairy cattle, so that in terms of absolute numbers, sheep account for approximately 95 per cent. of all stock. But for purposes of estimating stocking rates, and for comparing the different types and breeds of stock, it is usual practice to convert all stock numbers to a common measure, on the basis of the grazing requirements of each type of animal. In this report the convention has been followed of expressing all stock number in terms of dry sheep equivalents, on the following basis.[5]

1 Merino, Polwarth or comeback wether = 1 dry sheep.
1 Merino, Polwarth or comeback ewe and lamb = $1\frac{1}{3}$ dry sheep.
1 Corriedale, crossbred or British breed hogget, ewe or wether = $1\frac{1}{3}$ dry sheep.
1 Corriedale, crossbred or British breed lamb = $\frac{2}{3}$ dry sheep.
1 Ram (any breed) = 2 dry sheep.
1 Mature beef animal = 8 dry sheep.
1 Steer or heifer = 5 dry sheep.
1 Weaner calf = 3 dry sheep.
1 Milking cow = 9 dry sheep.
1 Hack = 8 dry sheep.

[5] These ratios have been adapted from those previously used by this Division, and by the Bureau of Agricultural Economics.

TABLE XI.

*Relative Importance of Sheep and Cattle (in terms of sheep equivalents) in each Shire.*

| Type of Stock. | Shire. | | | | | |
|---|---|---|---|---|---|---|
| | Tumbarumba. | Kyeamba. | Tumut. | Holbrook. | Gundagai. | Region. |
| | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. |
| Sheep ... ... | 71·4 | 80·3 | 66·4 | 80·5 | 74·9 | 74·5 |
| Beef Cattle ... | 24·1 | 18·0 | 29·4 | 18·0 | 22·8 | 22·7 |
| Other Stock ... | 4·5 | 1·7 | 4·2 | 1·5 | 2·3 | 2·8 |

These ratios have been used to calculate the relative importance of sheep and cattle in the different shires, and in the survey region as a whole, as set out in Table XI. Throughout the region beef cattle constitute about 23 per cent. of the total number of sheep equivalents, but in Tumut shire they account for 30 per cent., while in the two westerly shires, Kyeamba and Holbrook, they account for only 18 per cent. This reflects the differing topographies of the shires, as cattle are more suited, and sheep less suited to steep, rugged and uncleared country, found mainly in the eastern portion of the area.

The higher percentages of "other stock" recorded in Tumbarumba, Tumut and Gundagai shires is due to the inclusion in the sample of eight properties where dairying was carried on in addition to sheep and beef cattle raising. The dairy enterprise was either a small-scale sideline or was operated by another person on a share basis. In some of the latter cases dairying made quite a substantial contribution to the property income, but since he received only half of the dairy profits, a smaller contribution to the owner's income, with the result that he was eligible for inclusion in the survey sample.

**The Sheep Population.**

The composition of the total sheep population of the survey properties is shown in Table XII. (Note that the unit used is head of stock, not sheep equivalent.) The table clearly shows the preponderance of Merino sheep in the area: particularly noteworthy is the large number of Merino wethers, which constitute the largest single type of sheep. Corriedales are next in importance to Merinos, and are followed by crossbred, comeback, Polwarth and British breeds (mainly Romney Marsh). When the various breeds are compared in terms of sheep equivalents, as in Table XIII, this order remains unchanged, although the proportions change.

TABLE XII.

*The Sheep Population.*

*Classified by Breed and Type.*

| Breed. | Type. | | | | | |
|---|---|---|---|---|---|---|
| | Lambs. | Hoggets. | Ewes. | Wethers. | Rams. | Total. |
| | Number of Sheep. | | | | | |
| Merino ... ... | 18,973 | 14,090 | 40,446 | 64,255 | 1,236 | 139,000 |
| Polwarth ... ... | 6,288 | 4,241 | 8,421 | 6,129 | 297 | 25,376 |
| Comeback ... | 15,300 | 11,270 | 21,410 | 7,094 | 8 | 55,082 |
| Corriedale ... | 18,843 | 12,490 | 28,167 | 8,420 | 809 | 68,729 |
| Crossbred ... | 19,950 | 5,503 | 27,285 | 6,030 | ... | 58,768 |
| British ... ... | 1,131 | 631 | 1,980 | ... | 749 | 4,491 |
| Total ... | 80,485 | 48,225 | 127,709 | 91,928 | 3,099 | 351,446 |

TABLE XIII.

*Relative Importance of Breeds of Sheep (in terms of sheep equivalents) in each Shire.*

| Breed. | Shire. | | | | | |
|---|---|---|---|---|---|---|
| | Tum-barumba. | Kyeamba. | Tumut. | Holbrook. | Gundagai. | Region. |
| | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. |
| Merino ... ... | 17·1 | 44·9 | 51·8 | 33·4 | 39·6 | 37·1 |
| Polwarth ... | 14·0 | 0·6 | 11·3 | 11·6 | 0·1 | 6·2 |
| Comeback ... | 5·6 | 23·5 | 6·8 | 33·4 | 5·1 | 13·0 |
| | 19·6 | 24·1 | 18·1 | 45·0 | 5·2 | 19·2 |
| Corriedale ... | 30·0 | 22·4 | 21·4 | 15·1 | 24·2 | 23·1 |
| Crossbred ... | 32·4 | 8·3 | 6·5 | 6·4 | 27·8 | 18·7 |
| | 62·4 | 30·7 | 27·9 | 21·5 | 52·0 | 41·8 |
| British ... ... | 0·9 | 0·3 | 2·2 | 0·1 | 3·2 | 1·9 |

Classification of flocks by breed is rather difficult as less than half the flocks are composed of a single breed (23 per cent. of pure Merino, 5 per cent. of Polwarth, 13 per cent. of Corriedale and 6 per cent. cross-bred ewes mated to British breed rams). A classification of breeding flocks, by ewe and ram breeds, is given in Table XIV: it shows the many combinations of breeds that are used by survey graziers. (In fact, the situation is even more complicated than the table indicates, as a number of graziers run Merino wethers in addition to the breeds shown. Not shown in the table are thirteen graziers who run wethers only.)

As Table XIII shows, there are some important variations in the composition of flocks in different shires. Tumbarumba and Gundagai Shires have the highest proportion of Corriedale and cross-bred sheep, and the former shire has far fewer Merino sheep than any other shire. The highest concentration of Merinos is found in Tumut Shire, where they outnumber all other breeds. The distribution of breeds in Kyeamba and Holbrook Shires is broadly similar to that found in Tumut Shire, but Holbrook is outstanding in the number of come-back and Polwarth sheep carried. The higher percentage of British breeds recorded for Gundagai and Tumut Shires is brought about by the inclusion in the sample of a Romney Marsh stud property from each of these shires.

**Wool Production.**

Sheep are used in the survey area both for wool growing and for the raising of fat and store lambs, but the former enterprise is by far the more important. The average total wool clip in 1954-55 on the survey properties was fifty-six bales, and the average wool production per 100 sheep equivalents was 2.39 bales. Wool production per sheep was highest in the three shires having the highest proportion of fine wool sheep (Holbrook, 2.84 bales; Kyeamba 2.67 bales; and Tumut, 2.5 bales per 100 sheep equivalents) and lowest in Tumbarumba and Gundagai Shires (2.18 and 2.09 bales per 100 sheep equivalents, respectively). A comparison of wool production in 1954-55 with that of the previous year shows that it increased by 5 per cent.

TABLE XIV.

*Classification of Breeding Flocks by Breeds of Ram and Ewe.*

| Breed(s) of Ewe Used. | Breed(s) of Ram used. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Merino. | Merino and Polwarth. | Polwarth. | Merino and Corriedale. | Corriedale. | Merino and British. | Polwarth and British. | Corriedale and British. | British. | Corriedale, Polwarth and British. | Total. |
| Merino ... ... ... ... | 27 | ... | ... | ... | 2 | 1 | ... | ... | ... | ... | 30 |
| Merino and Polwarth and/or Comeback ... ... ... ... | 4 | 1 | 3 | 1 | 1 | ... | ... | ... | ... | ... | 10 |
| Polwarth and/or Comeback ... | 11 | ... | 9 | ... | 2 | 1 | 1 | 1 | 1 | ... | 26 |
| Merino and Corriedale and/or Crossbred ... ... ... ... | 4 | ... | ... | 2 | 3 | 2 | ... | ... | 1 | ... | 12 |
| Polwarth and/or Comeback and Corriedale and/or Crossbred ... | 2 | 1 | ... | ... | 1 | 1 | 1 | ... | 1 | 1 | 8 |
| Corriedale and/or Crossbred ... | 3 | ... | 2 | 2 | 20 | 1 | ... | 9 | 12 | ... | 49 |
| Corriedale and/or Crossbred and Romney Marsh ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | 2 |
| Total ... ... ... | 51 | 2 | 14 | 5 | 29 | 6 | 2 | 10 | 17 | 1 | 137 |

The spinning quality of the wool produced by the different breeds in the survey area is as follows:—

Merinos: mainly 64's, but ranging from 60's to 70's, with a few as high as 74's in the Tumut-Tumbarumba area.

Comeback and Polwarth: mainly 60's, with a range from 58's to 64's, some odd "hungry fine" types as high as 70's.

Corriedale: mainly 58's, some 56's, a few coarser.

Cross-bred (first cross): mainly 56's, some 58's, some odd 54's.

Cross-bred (second cross): mainly 56's, some 50's, a few 46's and 48's.

**Fat Lamb Production.**

Lambs for sale are raised mainly from cross-bred and Corriedale ewes, either Corriedale or British breed rams being used as sires. In terms of sheep equivalents, Corriedale and cross-bred sheep constitute about 42 per cent. of the total sheep population, but the importance of the fat lamb enterprise on properties carrying these types of sheep varies considerably. Where British breed rams are used, the whole of the lamb drop is normally available for sale, as the ewe portion is not suitable for breeding purposes. Where Corriedale rams are used, however, the ewe portion is usually retained for flock replacements, only the wether lambs becoming available for sale. Corriedale, and, to a lesser extent, cross-bred sheep are commonly used essentially for wool production, lambs being sold as occasion permits. Climatic conditions over the greater part of the area are such that it is not possible to fatten lambs for the early market, so that most are sold late in the season, and a proportion is often carried over and sold as weaners. A few graziers sell their lambs in store condition off shears to buyers from other districts.

Romney Marsh rams are the most popular fat lamb sires in the area (18 cases), followed by Dorset Horn (12 cases), Southdown (9 cases) and Border Leicester and Ryeland (1 case each).

**Sheep Management.**

In Table XV details of the management practices, broadly grouped under the headings of flock quality, sheep health and lambing, are listed. While the majority of farmers do such things as class their flocks, treat footrot, drench and crutch there are great differences in the degree to which these practices are carried out, as the table shows.

*Classing and Culling.*—Almost half (46 per cent.) of those interviewed do not class their sheep. A similar proportion do their own classing while only 8 per cent. make use of the services of professional classers. The percentage culled varied considerably from property to property. All those who engaged a professional classer culled at a rate greater than 30 per cent.

*Ram Quality.*—As a measure of ram quality graziers were asked the usual price range of their ram purchases. The greater proportion of operators (42 per cent.) used rams costing between eleven and twenty guineas. Eight per cent. paid more than thirty guineas for their rams.

*Crutching.*—All operators crutched their sheep at least once per year. Twenty-three per cent. crutched twice. In the majority of such cases the holdings were in the warmer part of the survey area (where sheep are more prone to fly strike). None had used or intend to use the Mules operation.

*Footrot Control.*—The methods (or lack of methods) of footrot control on slightly more than half of the survey properties indicated that the operators did not have a proper understanding of the disease. Twenty-two per cent. of operators did not treat footrot in any way. Their usual solution of the problem was to sell the infected sheep. The dangers of this procedure are obvious. Of the 78 per cent. who did treat infected

TABLE XV.

*Sheep Management.*

| Aspect of Sheep Management. | Management Practice. | Details of Practice. | Percentage of Graziers Adopting Practice. |
|---|---|---|---|
| | | | Per cent. |
| Flock quality... | Flock classing ... | Do not class ... ... | 46 |
| | | Do own classing ... ... | 46 |
| | | Engage professional classer | 8 |
| | | Total ... ... | 100 |
| | Rate of culling in maiden ewes. | No culling ... ... ... | 46 |
| | | 1 to 10 per cent. ... ... | 18 |
| | | 11 to 20 per cent. ... ... | 14 |
| | | 21 to 30 per cent. ... ... | 10 |
| | | 31 to 40 per cent. ... ... | 8 |
| | | 41 to 50 per cent. ... ... | 4 |
| | | Total ... ... | 100 |
| | Price paid for rams... | Less than 10 guineas ... | 12 |
| | | 11 to 20 guineas ... ... | 42 |
| | | 21 to 30 guineas ... ... | 22 |
| | | More than 30 guineas ... | 8 |
| | | Unknown ... ... ... | 7 |
| | | Non-breeding flocks ... | 9 |
| | | Total ... ... | 100 |
| Sheep health ... | Crutching frequently | Once per year ... ... | 77 |
| | | Twice per year ... ... | 23 |
| | | Total ... ... | 100 |
| | Footrot control ... | Take preventive precautions | 46 |
| | | Use footbath for treatment | 78 |
| | | Use clean paddocks after treatment. | 61 |
| | Drenching ... ... | For fluke and worms ... | 100 |
| Lambing ... | Period for which rams run with ewes. | 4–5 weeks ... ... ... | 4 |
| | | 6–9 weeks ... ... ... | 60 |
| | | 10–13 weeks ... ... | 19 |
| | | 14–20 weeks ... ... | 5 |
| | | 52 weeks ... ... ... | 3 |
| | | Non-breeding flocks ... | 9 |
| | | | 100 |
| | Flushing of ewes ... | ..... | 18 |
| | Lambing percentage | More than 90 ... ... | 13 |
| | | 80–89... ... ... ... | 26 |
| | | 70–79... ... ... ... | 29 |
| | | 50–69... ... ... ... | 16 |
| | | Less than 50 ... ... | 6 |
| | | Non-breeding flocks ... | 10 |
| | | | 100 |

animals, usually by means of paring and the use of a footbath, one-quarter did not use clean paddocks after treatment. Only 46 per cent. of all operators interviewed took positive preventive precautions against footrot entering their properties. They also treated the disease when it did exist and used clean paddocks afterwards.

That many graziers did not understand the mode of transmission of footrot was indicated by the fact that they had a special paddock for infected sheep. They did not appreciate that such a paddock gave the virus a semi-permanent breeding ground on their holding.

*Drenching.*—All graziers drenched their ewes and lambs, for worms and fluke. However, only approximately one-third used clean paddocks after drenching. The majority of those interviewed inoculated their lambs against pulpy kidney.

*Mating Practices.*—Sixty per cent. of the graziers leave their rams with the ewes for a period of six to nine weeks. Very few (4 per cent.) use periods of less than six weeks, while 3 per cent. allow the rams to run with the ewes all the year.

Eighteen per cent. have adopted the practice of flushing ewes before mating.

*Lambing Percentages.*—Considering only those properties which had a breeding flock, slightly more than half had a lambing percentage of less than 70. Over the whole survey region, the lambing percentage was about 75.

One-third transferred ewes and lambs out of the lambing paddock to a saved paddock as soon as the lamb was born.

*Salt Feeding.*—Seventy per cent. of those interviewed provided salt or prepared licks for their sheep. Most did this not because they considered it necessary but because the sheep liked it. Some expressed the view that the sheeps' liking for salt was proof of its dietary value. In a few cases footbaths had been constructed around the licks as a measure against footrot.

These figures suggest that there are quite serious shortcomings in the standard of sheep management in the area, particularly in respect of measures to maintain and improve sheep quality (classing and purchase of rams) and of measures to prevent and control diseases, especially footrot.

**Beef Cattle Management.**

Beef cattle occupy an important place in the land utilization pattern of the region. In terms of stock equivalents, slightly less than one-quarter of all grazing stock are beef cattle. That they are so important is due mainly to the topographical limitations affecting sheep grazing in the

area. Nearly one-fifth of all land on survey properties was better suited to cattle than sheep. Approximately 80 per cent. of this country was uncleared and of very rough terrain. The remainder was low-lying land either swampy or subject to flooding.

However, cattle also have a place on the more normal pasture improved land where they can be used to regulate pasture growth during flush periods and to eat rank growth.

Thus beef cattle are normally a necessary adjunct of the sheep enterprise. They are run not so much as a risk spreader but in order to utilize fully farm resources. That this was realized by the graziers interviewed is attested by the fact that 88 per cent. of properties ran beef stock and that, of those operators with a beef enterprise, 82 per cent. claimed that cattle were necessary for full resource utilization. Of those with beef cattle only a quarter considered that they would be able to run more sheep if they sold all their cattle.

Table XVI shows details of various management practices as carried out on survey properties. It could not be said that a general pattern of management existed.

*Grazing Policy.*—Forty-four per cent. of the beef herds were grazed indiscriminately with the sheep. Of the remaining 56 per cent., which were grazed under a definite policy in relation to the sheep, the two most important groups were those grazed ahead of the sheep and those which were depastured on separate country to the sheep at certain periods of the year. Only 9 per cent. of herds were always on separate country from the sheep whilst 11 per cent. were finished off for market in special cattle paddocks. The rotating of cattle ahead of the sheep was much more popular than grazing them behind the sheep.

*Type of Beef Enterprise.*—As listed in the table, a great variety of beef enterprises are present in the area. The breeding of vealers (64 per cent. of properties) and of steers (46 per cent. of properties) were the two most popular enterprises. Thirty per cent. of the properties had more than a single type of beef enterprise.

Due to the natural suitability of most of the country and the saving in transport costs possible (many of the properties were rather isolated) breeding herds were most popular. Twelve per cent. of properties had no beef herd, while 83 per cent. had a breeding herd. Of the latter, 13 per cent. also had a non-breeding herd. Only 5 per cent. had only a non-breeding herd.

*Breed of Herd.*—Of all the stock used for beef production approximately 60 per cent. contained Hereford blood, slightly more than half of which were pure bred Herefords. However, practically all breeds of beef cattle were found to be represented in some measure. On a few properties dairy vealers and steers were raised as beef, the operators claiming that dairy cows produced better vealers.

## TABLE XVI.

*Beef Cattle Management.*

| Aspect of Cattle Management. | Broad Management Policy. | Details of Practice. | Percentage of Properties. |
|---|---|---|---|
| | | | Per cent. |
| Grazing policy (133 properties). | Same country as sheep. | With sheep ... ... ... | 44 |
| | | Before sheep ... ... | 19 |
| | | After sheep ... ... ... | 2 |
| | Different country from sheep. | Seasonally ... ... ... | 15 |
| | | Always ... ... ... | 9 |
| | | To finish off ... ... | 11 |
| | | Total ... ... | 100 |
| Type of beef enterprise (150 properties). | Breeding ... ... | Vealers ... ... ... | 35 |
| | | Steers ... ... ... | 18 |
| | | Vealers and steers ... ... | 15 |
| | | Vealers, steers and stud ... | 2 |
| | Breeding and non-breeding. | Fattened stores, vealers and/or steers. | 11 |
| | | Fattened stores and stud ... | 1 |
| | | Dealing and vealers ... | 1 |
| | Non-breeding ... | Fattened stores ... ... | 4 |
| | | Dealing ... ... ... | 1 |
| | No beef cattle ... | ..... | 12 |
| | | Total ... ... | 100 |
| Breed of herd (133 properties). | Pure bred beef ... | Hereford ... ... ... | 36 |
| | | Other ... ... ... | 12 |
| | Crossbred beef ... | Hereford cross ... ... | 19 |
| | | Other ... ... ... | 4 |
| | Dairy beef cross ... | Mainly Hereford cross ... | 12 |
| | Dairy... ... ... | Mainly A.I.S. ... ... | 2 |
| | Nondescript ... | ..... | 15 |
| | | Total ... ... | 100 |
| Size of herd (head of stock) (150 properties). | Nil ... ... ... | ..... | 12 |
| | Less than 50... ... | ..... | 30 |
| | 50 to 99 ... ... | ..... | 24 |
| | 100 to 199 ... ... | ..... | 14 |
| | 200 to 299 ... ... | ..... | 10 |
| | 300 to 399 ... ... | ..... | 3 |
| | 400 to 499 ... ... | ..... | 2 |
| | 500 or more ... ... | ..... | 5 |
| | | Total ... ... | 100 |
| Trend in herd size (150 properties). | 1951-52—1953-54 ... | Increase occurred ... ... | 41 |
| | | No change occurred ... | 42 |
| | | Decrease occurred ... ... | 17 |
| | | Total ... ... | 100 |
| | 1954-55—1956-57 ... | Increase planned ... ... | 30 |
| | | No change planned ... | 69 |
| | | Decrease planned ... ... | 1 |
| | | Total ... ... | 100 |

TABLE XVI—*continued.*

*Beef Cattle Management*—continued.

| Aspect of Cattle Management. | Broad Management Policy. | Details of Practice. | Percentage of Properties. |
|---|---|---|---|
| | | | Per cent. |
| Supplementary feeding (133 properties). | When practised ... | Never ... ... ... | 23 |
| | | In drought only ... ... | 31 |
| | | In drought and seasonally... | 43 |
| | | Drought, seasonal and for marketing. | 3 |
| | | Total ... ... | 100 |
| | Attitude to topping off for market. | Favourable ... ... ... | 16 |
| | | Unfavourable ... ... | 16 |
| | | Question never considered | 68 |
| | | Total ... ... | 100 |

Seventy-one per cent. of beef herds were comprised of pure bred beef (48 per cent.) and of crossbred beef stock (23 per cent.). In contrast, 85 per cent. of all beef stock were comprised of pure bred beef (65 per cent.) and of crossbred beef stock (20 per cent.). This is a reflection of the fact that cattle of mixed beef, dairy beef and nondescript type were usually run on the smaller properties.

*Herd Size.*—As would be expected from the great range of property sizes, the size of the beef herd varied considerably. However, there was a general tendency for larger properties to have a greater proportion of their stock as beef, probably because a greater proportion of their land was undeveloped and of rough terrain. Slightly more than two-thirds of all breeding herds had less than forty breeding cows. One-sixth had more than 100 breeding cows.

*Trend in Herd Size.*—During the three years prior to the survey the size of 41 per cent. of herds had increased while only 17 per cent. had decreased. In terms of total number of beef stock there had been an overall increase of 11 per cent. on 1951-52 figures.

This increasing trend may be expected to continue but probably not at such a rapid rate. While only one grazier planned to reduce his herd in the future three-year period, 30 per cent. planned an increase and 69 per cent. expected to make no change in the size of the cattle enterprise (compared with the 42 per cent. of herds which remained static in the prior three-year period).

Some changes with regard to policy were also planned by 12 per cent. of operators. These changes involved improving the quality of the stock (2 per cent.), adding an additional type of enterprise (4 per cent.) and changing from one type of enterprise to another (6 per cent.). Of the latter group the main switch was to be from steers to vealers and of the first group all graziers involved were going to add a vealer enterprise. Undoubtedly the most general feature of beef raising in the area is tending to be the production of vealers.

*Supplementary Feeding.*—As shown in Table XVI 43 per cent. of graziers with beef herds fed in drought and when seasonal conditions were harsh. Three per cent. in addition fed to finish their cattle off for market. Thirty-one per cent. fed only in drought whilst 23 per cent. never hand-fed.

An inquiry was made of graziers as to whether they had considered supplementary feeding for marketing purposes. Sixty-eight per cent. had not considered the matter. Of the remaining 32 per cent. half had favourable attitudes of whom a small number were already using supplements to top off their cattle. The more common reasons behind graziers unfavourable attitudes were that it was uneconomic and that it was unnecessary. No graziers considered force feeding to be necessary. usually because they estimated that the feed cost would not be compensated by the quicker turnover of stock gained by reducing marketing age by one or two months. On the average vealers were marketed at 11 months and steers at 24 months throughout the region.