

## REPORT ON AN ECONOMIC SURVEY OF NEW ENGLAND GRAZING PROPERTIES

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### 1. SUMMARY

The long, cold winters of the New England Tablelands give rise to various production problems for graziers. A major question is how to organize and adjust stock numbers for the fullest use of seasonal pasture production, arising from fairly reliable summer rainfall, without running too heavy risks with regard to overstocking during the winter. The situation is made more complex by the topographical and other features of the area which militate against hay-making and cropping. Certainly neither grass conservation nor the growing of fodder crops are widely practised.

The above and other aspects of the management problems of wool-growers are under current investigation by the Faculty of Agricultural Economics, University of New England, Armidale. It was therefore considered worthwhile to conduct a fact-finding survey of wool production economics in the New England; information was gathered at the same time on graziers' attitudes to winter feed factors.

The survey, based on records of the 1959-60 season, is the preliminary to more detailed appraisals of the technical and economic problems facing graziers in the New England. The survey sample was made up of 50 properties drawn from a universe of 1,137 properties each running more than 500 sheep in the Armidale Pastures Protection Board area. The sample is divided into four strata based on flock size; 501-1,000 sheep, 1,001-2,000, 2,001-5,000 and 5,001 sheep and over.

It was found that only a minority made hay. One-fifth of the graziers bought feed regularly; three-tenths never bought feed at all and the remaining half of the graziers in the sample bought feed as required. Nearly 30 per cent of the total grassland acres was sown to improved pastures.

Most graziers expressed the view that they could probably carry more stock but preferred not to do so because of the risks and uncertainties of drought situations; particularly those arising from a shortage of rain in late summer, with pastures going into the autumn and winter, brown and bare—as happened in 1959-60 and again in 1960-61.

The average wool clip for all sheep was just over 8 lb. per fleece; properties running only dry sheep had an average cut of 11 lb. per wether. The average net price of wool per lb. was 5s.

Thirty “sheep only” properties were analysed to obtain detailed costs and returns on a “per sheep” basis. Twenty-two of these properties were of less than 2,000 sheep and their gross returns per sheep amounted to £2. Total costs per sheep for these flocks of less than 2,000 sheep ranged from just 21s. to 22s. 3d. Farm income per sheep was 17s. 8d. for flocks of 501-1,000 sheep and 19s. for flocks of 1,001-2,000 sheep.

Graziers running less than 1,000 sheep were therefore, as a class, not earning reasonable wages for their manual labour, nor receiving any rewards for management nor showing any returns on capital.

Total capital value per acre ranged from an average of £13 for properties in the 2,001-5,000 sheep stratum to £20 in both the smallest and largest flock-size strata. The high per acre capital value for the larger properties is explained by the fact that it is on these properties that the greatest amount of pasture improvement has taken place and for the smaller properties because, all things other than size being equal, small properties are more costly per acre to purchase than larger ones. A 1,000 sheep property also requires almost as much in the way of buildings and plant as one running 4-5,000 sheep.

On a per sheep basis, therefore, the capital charge was much heavier in the 501-1,000 sheep stratum than in the other two flock-size strata of less than 5,000 sheep; for not only was there a higher capital cost per acre but properties in the smallest size stratum also had the lowest average stocking rates. Additionally, on such properties the enterprise is not large enough to spread overhead costs efficiently (e.g., properties of 2,001-5,000 sheep had a depreciation charge of 1s. 6d. per sheep less than properties in the smallest stratum). When an interest charge of an arbitrary 5 per cent was levied on the imputed capital values of the properties, the Labour and Management Income of these smaller properties was negative.

Unless graziers on small properties can increase wool returns (by increased price per lb. and/or raising the total clip—by more wool per sheep and/or greater stocking rates), lower their costs and/or turn to alternative and more profitable enterprises, their positions are very precarious if the present trend in wool prices continues.

On a per sheep basis, farm income is least on those properties with more than 5,000 sheep. However, a farm income of 9s. 6d. per sheep bulks a reasonable total farm income when at least 8,000 sheep are run—as was the case on the smallest of the larger properties. The return to capital on large properties was about 2½ per cent.

The average rate of return on capital for all properties (allowing £1,000 for occupier's labour and £700 for any other full-time, family labour)<sup>1</sup> was 2.6 per cent.

Properties designated "pasture improved", i.e., with more than one-quarter of total acreage down to sown grasses and clover, showed a higher rate of return to capital than any of the other sub-classes used in the presentation of the data.

The main feature of the survey material is the poor position of the smaller producers. Whether intensification by means of pasture improvement is the answer to their problems is not shown by the data. The nature of their dilemma is realized by most of these smaller producers. They know they cannot continue indefinitely to earn at their present low rate and yet, whilst most of them have no desire to leave the land, they are also loath to borrow for such an investment as pasture improvement (which is essentially a long-term project) against the background of uncertainty which surrounds the wool market.

Theirs is essentially a "small-farm" problem; aggravated by the fact that for most of them alternative enterprises are not possible and that they must of necessity specialize in the one commodity—wool.

## 2. INTRODUCTION

One of the factors limiting flock expansion in certain of the grazing areas with a high expectancy of adequate summer rainfall is the shortage of feed in the winters; especially if the winter is cold and long. Such an area is the New England region of New South Wales. Here the provision of winter feed is a major problem, particularly for the grazier wishing to increase his flock size to utilize the summer flush.<sup>2</sup>

The grazier has many possibilities from which to choose in providing winter feed.<sup>3</sup> He can save his pastures (particularly improved ones); he can grow crops for winter grazing, e.g., oats and/or turnips; he can grow cereals, head the crop and store the grain; he can conserve any surplus summer grass as hay or silage; he can buy in fodder as required or he can adjust the seasonal pattern of feed requirements by stocking policy and choice of enterprise, e.g., fat lamb production. The best of these alternatives will vary *inter alia* according to relative prices for wool and fat lambs and with changing price-cost relationships. The Faculty's research programme is intended to help producers make better decisions between the various possible adjustments.

It was decided, as a first step, to carry out a fact-finding survey of the financial structure of wool production in the area; at the same time compiling information by means of a questionnaire on graziers' attitudes to the

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<sup>1</sup>The writer does not consider, for various reasons, that this is the true opportunity cost of such labour in most instances. However, as it is impossible to evaluate the correct opportunity cost, some arbitrary figure had to be assigned.

<sup>2</sup>This is one of the management problems of wool production being investigated by the Faculty of Agricultural Economics of the University of New England.

<sup>3</sup>See A. G. Lloyd, "Fodder Conservation on the Southern Tablelands Wool Industry", this *Review*, Vol. 27, No. 1 (March, 1959), p. 5.

factors just described. This is to be a preliminary to more detailed appraisals of the problem.<sup>4</sup> It is also felt that the survey results may be of some interim interest to grazier organizations, advisory officers and any other people interested in economic conditions within the industry.

### 3. THE SURVEY AREA AND THE SAMPLE

The survey consisted of fifty properties and was based on their trading results for the financial year 1959-60. The universe sampled contained all properties carrying more than 500 sheep in the Armidale Pastures Protection Board area. There are variations in soil type, altitude, annual rainfall and distribution and expectancy of this rainfall in the area. The universe was made up of 1,137 properties which were put into the size groups shown in Table 1. The sample was made up of fifty properties whose size distribution is shown in Table 2. The three flocks greater than 5,001 sheep were treated as one group for analytical reasons. The smallest of these three larger properties grazes more than 8,000 sheep; the largest flock outside this group contains 4,431 sheep and the average flock for the 2,001-5,000 sheep stratum is less than 3,300. Clearly a quite considerable gap exists, and this particularly applies to labour costs as will be seen later, which justifies treating all flocks of more than 5,000 sheep as one statistical group. Treating these three properties as one group also helps to preserve the anonymity of the data.

Within the individual size strata sampling was quasi-random from lists. Eleven of the properties initially approached were, for various reasons, not included in the final sample. Their replacements were obtained in quasi-random fashion. Total sheep in the sample amounted to 104,193 and the total acreage was 110,057. The average size of the property was, therefore, 2,084 sheep on 2,201 acres. The estimated universe mean so nearly coincides with the actual sample mean for all the important economic factors that, for convenience sake, the actual sample mean has been used in all presentation of data and in the discussion.

The sample embraces properties which have no pasture improvement and others which are almost completely improved; properties which buy in all replacement sheep and others which breed them all; properties with no cattle on the place and others with a high cattle/sheep ratio; properties turning, in varying degrees, to fat lamb production; properties growing no crops at all and others growing crops for sale and/or sheep fodder; properties which never buy in feed and properties where it is an annual recurrence; properties where some hay is always made and others where it is never made and, finally, properties where there is severe capital rationing and those where lack of finance is not a hindrance to development.

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<sup>4</sup> Acknowledgment is here made of the help of the Wool Research Committee which is generously helping to finance the work over an initial three-year period. Thanks are also due to the officers of the P.P.B., Armidale, for their assistance in helping a newcomer to find his way around the region and to the individual graziers who co-operated in the survey.

TABLE 1

*Size Distribution of Flocks of more than 500 Sheep in the Armidale P.P.B. Area*

Flock Size	Number	Per cent
501—1,000 .. ..	364	32
1,001—2,000 .. ..	440	39
2,001—5,000 .. ..	263	23
5,001—10,000 .. ..	52	5
10,001—20,000 .. ..	13	1
20,001 and over .. ..	5	..
Total .. ..	1,137	100

TABLE 2

*Size Distribution of the 50 Sample Properties*

Flock Size	Number
501—1,000 .. ..	16
1,001—2,000 .. ..	20
2,001—5,000 .. ..	11
5,001—10,000 .. ..	2
10,001 and over .. ..	1

TABLE 3

*Enterprise Classification of the Sample Properties*

Enterprise	Number of Properties
Sheep Only* .. ..	30
Sheep/Cattle* .. ..	13
Sheep/Crops†‡ .. ..	7

\* Properties which carried 40 head of cattle and moreover carried more than 3 cattle per 100 sheep were classified as Sheep/Cattle. Properties running less than this number or ratio of cattle were designated Sheep Only—unless they fell into the category of Sheep/Crops.

† Properties which received more than £200 from crop sales.

‡ On four properties the crop was potatoes, on two maize, and on the other property, apples.

TABLE 4  
*Sheep Enterprise Classification of Sample Properties*

Sheep Enterprise	Number of Properties	Number of Sheep	Average Size of Property
1. Dry Sheep (for Wool Production)—			Sheep
(a) Merino Wool Production only ..	11	14,350	1,305
(b) Merino Wool Production; plus Cross-bred Fat Lambs .. ..	3	5,659	1,886
2. Merino Breeding all Replacements (no Fat Lambs Produced) .. ..	16	38,476	2,408
3. Breeding and Buying Replacements—			
(a) Merino Wool Production only ..	16	37,096	2,318
(b) Merino Wool Production; plus Cross-bred Fat Lambs .. ..	4	8,612	2,153
Total .. .. .	50	104,193	2,084

TABLE 5  
*Extent of Pasture Improvement Within Size Groups*

Number of Sheep	Total Grassland	Natural Pasture	Improved Pasture	
			Area	Per Cent of Total
	Acres	Acres	Acres	Per Cent
501—1,000 .. ..	14,660	12,602	2,058	14·0
1,001—2,000 .. ..	31,944	25,728	6,216	19·5
2,001—5,000 .. ..	26,148	16,718	9,430	36·1
5,001 and over .. ..	29,948	17,948	12,000	40·1
Total .. .. .	102,700	72,996	29,704	28·9

#### ENTERPRISE CLASSIFICATION

Table 3 shows the enterprise classification of the sample properties.<sup>5</sup> Table 4 shows the sample classified according to the nature of the sheep enterprise. All wool-growing was with Merinos; obviously a certain amount of wool was also obtained from sheep kept for fat lamb production.

Two of the producers under 1 (b) (Table 4) use Corriedale ewes for the fat lamb production—the one using a Corriedale, the other a Down ram; the third producer used a Down ram on bought-in c.f.a. Merino ewes. The range of fat lamb production under 3 (b) was wide—from a grazier producing a small number of fat lambs to utilize spare summer pasture to a producer who is in the process of changing over

<sup>5</sup> Much of this paper deliberately follows the reports on *The Australian Sheep Industry Survey* from the B.A.E., Canberra. This is for the sake of uniformity and for easy geographical and yearly comparisons.

entirely to fat lamb production on a highly improved property. The reasons given for the buying in and use of dry sheep as opposed to breeding replacements on the various properties varied from "pastures not suitable", "too many foxes" to "too much trouble".

#### 4. WINTER FEED SUPPLIES, PASTURE IMPROVEMENT AND STOCKING RATES

On only 10 of the 50 properties sampled is fodder bought regularly; excluding feed bought by the largest property in the sample, the average amount bought annually by these properties regularly short of feed was £174. On 15 of the other 40 properties fodder is never bought and on the remaining 25 (i.e., half the sample) it is bought in only as required.

Hay is made on only 12 properties. The average annual amount of 30 tons is usually from lucerne or oats. Twenty-five of the properties grew crops to help to fill the winter gap and 25 did not. The crops include oats for summer harvesting and feeding during the subsequent winter; maize; and oats and turnips for winter grazing. On many properties where some pasture improvement takes place each year by surface seeding, it is common practice to sow 30-40 acres under a cover crop of turnips.

Many graziers agreed that they were understocked but preferred to be so rather than have the headaches associated with winter feed problems if they pushed flock size to its limits. Many, too, considered that it was better to go for more wool per sheep rather than to keep more sheep in an attempt to increase wool yields per acre.

One reason why the problem of winter feeding is perhaps less acute than it may be in the future is that on many properties a great deal of pasture improvement has taken place over the recent years but flock size has not grown commensurately—either because the grazier is increasing flock size by the slow process of breeding all replacements or is buying in and capital limitation is restricting the speed of expansion. Consequently on such properties there is a fair amount of feed available during the winter from improved pastures which have not been grazed very hard during the summer and autumn. The extent of pasture improvement within the various flock-size strata is shown in Table 5.

Stocking rates have been calculated in two ways:

- (a) using adjusted "feed" acres but ignoring any difference between the feeding values of natural and improved pastures (Table 6) and
- (b) as a "grazing intensity" index when improved pasture is rated as having twice the carrying capacity of natural pasture which is expected to carry one adult sheep to the acre (Table 7).<sup>6</sup>

The calculations are based on ewe units and 1 beef animal is taken as the equivalent of 6 ewes.<sup>7</sup>

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<sup>6</sup> Straightforward stocking rates, i.e., with no adjustments to the acreages, are shown in Table 21 for 30 "sheep only" properties.

<sup>7</sup> This is in accord with the convention that 1 ewe is equivalent to 1.5 dry sheep and 1 adult beef animal equivalent to 9 dry sheep.

Firstly, ewe units were divided by "feed" acres for which purpose the following arbitrary assumptions were made: one acre of woodland grazing counted as equivalent to a half-acre of grassland; the feeding value of an acre of fodder crops rated as equivalent to two grassland acres; grassland rated equally whether natural or improved. Stocking rates under this system are shown in Table 6. On only four properties was there a stocking rate higher than two ewe units per feed-acre.

Secondly, an assessment of grazing intensity was made. The assumptions regarding woodland grazing and feed crop acres still obtain but it was assumed that an acre of improved grassland should carry two ewes. The results of this grazing intensity index are shown in Table 7.

Eleven properties had a grazing intensity index greater than 1; one of 1 and the other 38 were less than 1. Only one property had an index (1.51) higher than 1.5; this property also had the highest stocking rate (as measured for Table 6) of 2.60 sheep per acre. It was only ninth in its size grouping as regards rate of return on capital.

#### WOOL PRODUCTION

The average wool cut of all sheep and lambs shorn was 8.1 lb. The fleece weight data for flock size and type of sheep enterprise are shown in Tables 8 and 9. There were not enough properties producing fine wools in the sample to evaluate the effect of wool counts on economic performance; over 90 per cent of the properties produced wool in the 60-70's grades.

## 5. FINANCIAL ANALYSIS

### Capitalization

No attempt was made to value separately the capital represented by land, water supplies and fences; the "land" was valued as a unit. Buildings and machinery were valued item by item at current values. The homestead was not included in the valuations at any stage. The interest earnable on the capital value of the homestead does not represent an opportunity cost as far as wool production is concerned as the grazier would need a home whether he stayed in production or moved out and lived elsewhere.

TABLE 6  
*Stocking Rates, Ewe Units per "Feed" Acre*

Flock Size	Stocking Rate per Acre
501—1,000 .. ..	0.86
1,001—2,000 .. ..	0.88
2,001—5,000 .. ..	1.18
5,001 and over .. ..	0.91
Whole Sample ..	0.93



TABLE 7  
*Stocking Rates—Grazing Intensity*

Flock Size	Index
501—1,000 .. ..	0.80
1,001—2,000 .. ..	0.82
2,001—5,000 .. ..	0.94
5,001 and over .. ..	0.67
Whole Sample .. ..	0.83

TABLE 8  
*Mean Cut of Wool per Sheep: Flock Size*

Number of Sheep	Mean Wool Cut
	lb.
501—1,000 .. ..	7.4
1,001—2,000 .. ..	8.4
2,001—5,000 .. ..	8.1
5,001 and over .. ..	8.3
Whole Sample .. ..	8.1

TABLE 9  
*Mean Cut of Wool per Sheep: Sheep Enterprise*

Enterprise	Number of Properties	Mean Wool Cut
		lb.
1. Dry Sheep (for Wool Production)		
(a) Merino Wool Production only .. ..	11	11.0
(b) Merino Wool Production; plus Cross-bred Fat Lambs .. ..	3	6.6
2. Merino: Breeding all Replacements (No Fat Lamb Production) .. ..	16	7.4
3. Breeding and Buying Replacements		
(a) Merino Wool Production only .. ..	16	8.1
(b) Merino Wool Production; plus Cross-bred Fat Lambs .. ..	4	7.9

TABLE 10  
*Capital Structure (£) by Property Size (Number of Sheep)*

Stratum Size	501-1,000 Sheep	1,001-2,000 Sheep	2,001-5,000 Sheep	5,001 Sheep and Over	Whole Sample
Number of Properties .. ..	16	20	11	3	50
Item—	£	£	£	£	£
Land and Improvements .. ..	12,729	17,675	35,364	176,667	29,524
Machinery .. ..	947	1,096	1,700	6,750	1,520
Stock .. ..	3,038	4,622	8,381	35,583	6,800
Total Capital Value .. ..	16,714	23,393	45,445	219,000	37,844
± Working Capital .. ..	— 441	— 1,515	— 4,725	— 933	— 1,843
Realizable Value of Property ..	16,273	21,878	40,720	218,067	36,001
5 per cent Capital Charge ..	814	1,094	2,034	10,903	1,799

All livestock valuations were those which the graziers themselves put on the stock on their individual properties. Sheep values varied from property to property because of the diversity of sheep enterprises within the sample and disparity of values meant that to have applied average prices could have been misleading.

Working capital requirements were assessed on the size of the current account balances. Where an overdraft existed it was deducted from the total value of land and improvements, buildings, plant and stock. The figure thus used is the realizable capital value of the property and it is this which would be available for investment if the grazier sold up. It is against this amount that the conventional interest charge of 5 per cent was levied as being the opportunity cost of capital invested in the property, i.e., interest was computed on owner's equity only.

At the bottom of the Costs schedule (Table 13) "Capital Expenditure" is shown as a separate item. This embraces capital expenditure during the year under review on such items as new fences, buildings, roads, bores, etc., and also land improvements such as land clearance and pasture improvement. All expenditure on fertilizers, seed, fuel and labour for pasture improvement in the current year was capitalized; fertilizer expenditure on improved land in its second year has been capitalized also. Fertilizer costs on improved land in its third or later years is treated as a running cost and not capitalized. Table 10 shows the capital structure of properties by flock size.

### Returns

The average gross returns by property size are shown in Table 11. It should be noted that only the net value for wool is included; wool selling charges were deducted here and not included among Costs. If these charges are treated as a cost, gross returns would have to be increased accordingly; income stays the same either way.

Sheep trading is the profit or loss from the sheep trading account using the same values as for calculating capital. The cattle figure is the profit or loss from the cattle trading account. These stock were valued, as for sheep, by each grazier for his own property. Any horse deaths, resulting in a loss on the horse account, were divided so as to spread out over eight years—this period being taken as the working life of a horse. The high figure for horse trading in the 501-1,000 flock-size group arose from the rearing of horses as a hobby by one grazier. Miscellaneous income was derived from contract work for other people, sale of timber, agistment, and the like. Stock killed for rations were excluded from the stock trading account and included as income "In Kind" along with milk and butter. Eggs were not treated as income "In Kind" as it is well within the capacity of anyone with a garden to produce eggs from domestic fowls. Admittedly, the grazier may be able to feed his hens more cheaply than the ordinary householder, but he is not in an especially advantageous position. To be able to graze dairy cows is, however, of some benefit and the actual consumption of milk and butter for each family was individually calculated and credited at the prevailing local prices. Surplus milk fed to farm dogs or otherwise disposed of was not included. The average net price per lb. received for wool, by property size, is shown in Table 12.

**TABLE 11**

*Gross Returns (£) by Property Size (Number of Sheep)*

Stratum Size	501-1,000 Sheep	1,001-2,000 Sheep	2,001-5,000 Sheep	5,001 Sheep and Over	Whole Sample
Number of Properties .. ..	16	20	11	3	50
	£	£	£	£	£
Item— Sheep— (a) Wool					
Gross .. ..	1,764	3,369	6,655	19,309	4,535
Less— Selling Charges .. ..	145	241	414	1,187	305
Net .. ..	1,619	3,128	6,241	18,122	4,230
(b) Skins .. ..	12	18	13	241	29
(c) Sheep Trading .. ..	— 1,631	— 3,146	6,254	18,363	4,259
Total .. ..	142	278	17	5,586	182
Total .. ..	1,489	2,868	6,271	23,949	4,441
Cattle .. ..	164	351	420	3,095	471
Horses .. ..	15	..	3	3	4
Crops .. ..	122	371	84	..	206
Miscellaneous .. ..	42	35	10	321	48
In Kind .. ..	160	141	174	163	156
Total .. ..	1,992	3,766	6,956	27,531	5,326

**TABLE 12**  
*Average Net Wool Price by Property Size (Number of Sheep)*

Number of Sheep	Average Net Price per lb. of Wool
501—1,000 .. ..	pence 56·5
1,001—2,000 .. ..	59·3
2,001—5,000 .. ..	62·0
5,001 and over .. ..	59·6
Whole Sample .. ..	<hr/> 59·9

### Costs

All costs incurred in the running of the properties are shown in Table 13. Hired labour employed in the homestead has been excluded. Where there was a partnership or full-time family labour used on the property in addition to the grazier himself no charge was made for this family labour in the Costs table (Table 13). The adjustment is made at the Return to Capital stage—Table 19.

### Labour

The use of permanent labour is seen to become of increasing importance as property size increases. No property of less than 1,000 sheep employed a full-time man, two properties in the 1,001-2,000 sheep size group employed a regular man and nine of the eleven properties in the 2,001-5,000 group did so. On the properties greater than 5,001 sheep the least number of men employed was five.

The breakdown of costs on the thirty "Sheep Only" properties of the sample is shown in Table 14. It needs to be noted that these thirty, "sheep only", properties do not reflect the size distribution of the sample as a whole. The 5,001-and-over sheep properties, which have higher costs per sheep than smaller properties, bulk proportionately larger. The details of the above, costs per sheep, structure are given in Table 20. As in Table 13, wool selling charges are not here included as a cost. On a cost per sheep basis wool selling charges would be in the region of 3s. 6d. per sheep depending on the wool production of the sheep, type of wool produced and the extent of classification and size of lots when it left the property. Three of the properties are owned in partnership and the labour of the partner is not introduced into the analysis until the "Income" stage. If on a per-sheep basis a wool selling charge of 3s. 6d. were included and 6d. allowed for the uncosted partnership labour, total costs per sheep are increased by 4s. and average total costs per sheep are in the region of 34s. to 35s.

TABLE 13  
*Cost Structure (£) by Property Size (Number of Sheep)*

Stratum Size	501-1,000		1,001-2,000		2,001-5,000		5,001 and Over		Whole Sample	
Number of Properties ..	16		20		11		3		50	
Item—	£	per cent	£	per cent	£	per cent	£	per cent	£	per cent
Labour										
Wages .. .. .	15	..	89	..	602	..	6,307	..	552	16.5
Shearing .. .. .	83	..	207	..	491	..	2,240	..	352	10.6
Other* .. .. .	40	..	111	..	88	..	963	..	134	4.0
Total .. .. .	138	13.1	407	20.0	1,181	28.3	9,510	45.1	1,038	31.1
Materials										
Fuel .. .. .	104	..	139	..	194	..	441	..	158	4.7
Fertilizer .. .. .	52	..	183	..	616	..	2,945	..	402	12.1
Seed † .. .. .	17	..	17	..	5	..	..	..	14	0.4
Fodder .. .. .	39	..	46	..	105	..	948	..	111	3.3
Packs, bags and twine	28	..	54	..	52	..	158	..	51	1.5
Drenches, dips, Vet., etc.	79	..	127	..	263	..	697	..	176	5.3
Pests and Vermin .. .. .	8	..	7	..	44	..	33	..	17	0.5
Repairs—										
Plant .. .. .	63	..	72	..	121	..	219	..	88	2.7
Improvements .. .. .	47	..	82	..	211	..	1,408	..	179	5.4
Total .. .. .	437	41.6	727	35.7	1,611	38.7	6,849	32.4	1,196	35.9
Services—										
Freight and Cartage .. .. .	22	..	82	..	136	..	345	..	91	2.7
Stock Transport .. .. .	13	..	101	..	14	..	250	..	62	1.9
Insurance .. .. .	33	..	47	..	102	..	620	..	88	2.7
Rates and Taxes .. .. .	126	..	232	..	305	..	1,227	..	274	8.2
Miscellaneous ‡ .. .. .	69	..	97	..	222	..	1,177	..	181	5.4
Total .. .. .	263	25.1	559	27.5	779	18.7	3,619	17.2	696	20.9
Depreciation § .. .. .	154	14.6	187	9.2	269	6.5	977	4.6	242	7.3
Interest on Borrowed Capital .. .. .	58	5.6	155	7.6	326	7.8	151	0.7	161	4.8
Total Costs .. .. .	1,050	100	2,035	100	4,166	100	21,106	100	3,334	100
Capital Expenditure on Improvements .. .. .	£ 133		£ 259		£ 545		£ 2,294		£ 404	

\* Includes contract operations and stores and rations for employed labour.

† Used other than for pasture improvement.

‡ Includes travel; telephone; legal, bank and accountancy charges; subscriptions and journals; marketing charges for stock and crops; sundries.

§ 2½ per cent on buildings; 10 per cent on plant.

**TABLE 14**  
*Costs per Sheep: Thirty "Sheep Only"\* Properties*

Item	Cost
Labour—	Shillings
Wages .. .. .	5·60
Shearing .. .. .	3·47
Other.. .. .	1·01
Total .. .. .	10·08
Materials—	
Fuel .. .. .	1·35
Fertilizer .. .. .	3·32
Seed .. .. .	0·07
Fodder .. .. .	1·26
Packs, Bags and Twine .. .. .	0·36
Drenches, Dips, Vet., etc. .. .. .	1·49
Pests and Vermin .. .. .	0·11
Repairs: Plant .. .. .	0·68
Improvements .. .. .	1·60
Total .. .. .	10·24
Services—	
Freight and Cartage .. .. .	0·77
Stock Transport .. .. .	0·40
Insurance .. .. .	0·88
Rates and Taxes .. .. .	2·68
Miscellaneous .. .. .	1·75
Total .. .. .	6·48
Depreciation .. .. .	2·11
Interest on Borrowed Capital .. .. .	1·54
Total Costs .. .. .	30·45

\* If cattle present, less than 40 head and less than 3 per cent of sheep numbers; if sale crops grown, less than £200 worth.

### Income

Income is first shown as Farm Income, i.e., the difference between gross returns and costs. A deduction from Farm Income of a charge against capital of 5 per cent of the total investment gives Labour and Management Income. The analysis is shown up to this point for various breakdown categories in Tables 15 to 18. A further measure of income is the return to capital (and some management).<sup>8</sup> Expressed as a percentage of the capital invested it shows the rate of return under different systems and property sizes and is very useful for comparative purposes. Table 19 brings together the rates of return to capital under the various breakdowns featured in Tables 15 to 18; this is to facilitate comparison. It is only at this point that, where partnerships exist (on six properties), the junior partner's labour has been put in as a cost (at £700).

<sup>8</sup> As previously stated, £1,000 has been allowed for operator's labour as being the true opportunity cost of such labour. However, some people will feel that this sum includes a return for management whereas on certain properties the figure is not high enough to provide the amount that the management would earn if salaried.

TABLE 15

*Labour and Management Income (£) by Property Size (Number of Sheep)*

Stratum Size	501-1,000	1,001-2,000	2,001-5,000	5,001 and Over	Whole Sample
Number of Properties .. ..	16	20	11	3	50
Item—	£	£	£	£	£
Returns .. .. .	1,992	3,766	6,956	27,531	5,326
Costs .. .. .	1,050	2,035	4,166	21,106	3,333
Farm Income .. .. .	942	1,731	2,790	6,425	1,993
Less 5 per cent on Equity Capital	814	1,094	2,034	10,903	1,799
Labour and Management Income	128	637	756	— 4,478	194

TABLE 16

*Labour and Management Income (£) by Enterprises*

Enterprise	Sheep Only	Sheep and Cattle	Sheep with Crops	Whole Sample
Number of Properties .. ..	30	13	7	50
Item—	£	£	£	£
Returns .. .. .	5,109	5,737	5,492	5,326
Costs .. .. .	3,365	3,385	3,103	3,333
Farm Income .. .. .	1,744	2,352	2,389	1,993
Less 5 per cent on Equity Capital	1,713	2,161	1,498	1,799
Labour and Management Income	31	191	891	194

TABLE 17

*Labour and Management Income (£) by Sheep Enterprises*

Enterprise	Merino Dry Sheep	Merino: Dry Sheep and Cross-bred Fat Lambs	Merino: Breeding Replacements	Merino: Both Breeding and Buying Replacements	Merino: Breeding and Buying Replacements and Cross-bred Fat Lambs	Whole Sample
Number of Properties .. ..	11	3	16	16	4	50
Item—	£	£	£	£	£	£
Returns .. .. .	3,853	3,671	6,629	5,460	4,866	5,326
Costs .. .. .	2,180	2,631	4,174	3,330	3,676	3,333
Farm Income .. .. .	1,673	1,040	2,455	2,130	1,190	1,993
Less 5 per cent on Equity Capital .. .. .	1,156	596	2,554	1,834	1,316	1,799
Labour and Management Income .. .. .	517	444	— 99	296	— 126	194

TABLE 18

*Labour and Management Income (£) by Extent of Pasture Improvement*

Pastures	Improved* (Including the 3 Properties of 5,001 Sheep and Over)	The Three (Improved) Properties of 5,001 Sheep and Over	Improved (Excluding the 3 Properties of 5,001 Sheep and Over)	Unimproved	Whole Sample
Number of Properties .. ..	22	3	19	28	50
	£	£	£	£	£
Item— Returns .. .. .	8,134	27,531	5,071	3,119	5,326
Costs .. .. .	5,361	21,106	2,875	1,739	3,333
Farm Income .. .. .	2,773	6,425	2,196	1,380	1,993
Less 5 per cent on Equity Capital .. .. .	2,584	10,903	1,271	1,183	1,799
Labour and Management Income .. .. .	189	— 4,478	925	197	194

\* Where more than one-quarter of the grassland area has been improved, i.e., the natural/improved pastures ratio is closer than 3:1.

The above percentages must be treated with a certain amount of caution as property valuation is difficult; the greatest care was taken to obtain as correct a figure as possible on which to base rates of return to capital. This *caveat* having been noted, the outstanding features of the above returns to capital data are the negative returns to capital where flock size is less than 1,000 and the difference in the rate of return to capital between improved and unimproved properties; the latter is perhaps to be expected even though, of course, the capital sum involved on which the rate of return is computed is necessarily much higher on improved than unimproved properties. In other words, there is a higher rate of investment per acre on such properties and this greater investment also carries a higher percentage return. The figures relating to fat lamb production could be misleading as only small numbers are concerned and certain special features obtain. On three of the properties concerned there has been heavy investment recently in pasture improvement and this has not yet started to yield the to-be-expected dividends.

The negative rate of return to capital on the smaller properties is partly determined by the fact that less than half of these properties are "improved" and more than half of them are "sheep only"—both these factors making for low capital earnings as the data in Table 19 show. Only four of the sixteen smaller properties were "improved", whereas there were nine out of twenty in the 1,001-2,000 group and six out of eleven in the 2,001-5,000 group. A more revealing aspect of the problems of the small property is to be seen by looking at the data in terms of returns, costs, etc., per sheep for "sheep only" properties. These are shown in Table 20.



TABLE 19

*Rate of Return (%) to Capital by Various Classifications*

BY PROPERTY SIZE (NUMBER OF SHEEP)

500-1,000	1,001-2,000	2,001-5,000	5,001 & over	Whole Sample
(16)* per cent —0.9	(20) per cent 2.9	(11) per cent 3.9	(3) per cent 2.8	(50) per cent 2.6

BY ENTERPRISES

Sheep Only	Sheep with Cattle	Sheep with Crops	Whole Sample
(30)* per cent 2.2	(13) per cent 2.9	(7) per cent 3.6	(50) per cent 2.6

BY SHEEP ENTERPRISES

Merino Dry Sheep	Merino Dry Sheep and Cross-bred Fat Lambs	Merino: Breeding Replacements	Merino: Both Breeding and Buying Replacements	Merino: Breeding and Buying Replacements and Cross-bred Fat Lambs	Whole Sample
(11)* per cent 2.9	(3) per cent 0.3	(16) per cent 2.8	(16) per cent 2.5	(4) per cent 0.7	(50) per cent 2.6

BY EXTENT OF PASTURE IMPROVEMENT

Improved (Including the Three Properties of 5,001 Sheep and Over)	The Three (Improved) Properties of 5,001 Sheep and Over	Improved (Excluding the Three Properties of 5,001 Sheep and Over)	Unimproved	Whole Sample
(22)* per cent 3.4	(3) per cent 2.8	(19) per cent 4.3	(28) per cent 1.1	(50) per cent 2.6

\* Throughout this table figures in brackets indicate number of properties.

TABLE 20

*Financial Structure on a Per-Sheep Basis by Flock Size for 30 "Sheep Only" Properties*

Item	501-1,000	1,001-2,000	2,001-5,000	5,001 and Over	Whole Sample
	(10 Properties 8,908 sheep)	(12 Properties 18,997 Sheep)	(6 Properties 18,928 Sheep)	(2 Properties 19,449 Sheep)	(30 Properties 66,282 Sheep)
	Shillings				
<i>Costs*</i>					
<i>Labour—</i>					
Wages .. .. .	0.55	0.54	3.73	14.68	5.60
Shearing .. .. .	1.89	2.35	3.40	5.35	3.47
Other .. .. .	0.54	0.30	0.53	2.38	1.01
Total .. .. .	2.98	3.19	7.66	22.41	10.08
<i>Materials—</i>					
Fuel .. .. .	2.14	1.71	0.92	1.04	1.35
Fertilizer .. .. .	0.81	1.92	4.26	4.94	3.32
Seed .. .. .	0.29	0.12	..	..	0.07
Fodder .. .. .	0.87	0.40	0.73	2.79	1.26
Packs, Bags and Twine .. .. .	0.41	0.33	0.34	0.37	0.36
Drenches, Dips, Vet., Etc. .. .. .	1.84	1.37	1.79	1.15	1.49
Pests and Vermin .. .. .	0.04	0.03	0.33	0.01	0.11
Repairs; Plant .. .. .	1.27	0.81	0.64	0.31	0.68
Improvements .. .. .	0.96	0.69	1.45	2.94	1.60
Total .. .. .	8.63	7.38	10.46	13.55	10.24
<i>Services</i>					
Freight and Cartage .. .. .	0.42	1.03	0.70	0.75	0.77
Stock Transport .. .. .	0.29	0.41	0.08	0.77	0.40
Insurance .. .. .	0.79	0.62	0.67	1.38	0.88
Rates and Taxes .. .. .	2.83	2.79	2.22	2.96	2.68
Miscellaneous .. .. .	1.65	1.19	1.24	2.82	1.75
Total .. .. .	5.98	6.04	4.91	8.68	6.48
<i>Depreciation</i> .. .. .	3.38	2.06	1.77	1.90	2.11
<i>Interest on Borrowed Capital</i> .. .. .	1.29	2.39	1.91	0.47	1.54
Total Costs .. .. .	22.26	21.06	26.71	47.01	30.45
<i>Returns</i> .. .. .	39.94	40.07	44.92	56.44	46.24
<i>Farm Income</i> .. .. .	17.68	19.01	18.21	9.43	15.79
<i>Capital (at 5 per cent)</i> .. .. .	18.16	11.63	12.53	21.04	15.51
<i>Labour and Management Income</i>	— 0.48	7.38	5.68	— 11.61†	0.28

\* Ignoring: (a) Wool selling charges (wool returns are net); (b) partnership labour (see p. 172).

† Not Labour and Management Incomes, as both properties have salaried managers and their cost has been deducted under "Labour", but profit (i.e., loss).

Among the interesting features of Table 20 is the fact that up to the Farm Income stage the 501-1,000 size flocks show up well. They produce a reasonably good Farm Income per sheep (even though they produce less wool and receive a lower price for it than larger properties—Tables 8 and 12) because of the operator's labour not being charged as a cost

and the virtual absence of regular hired labour. These small properties however do not carry enough sheep to bulk a decent income for their occupiers nor to show a fair return to capital; an average rate of -0.9 per cent being obtained by all properties in this size group (Table 19).

The high capital charges per sheep reduce Farm Income to negative proportions at the Labour and Management Income level. It is only when capital is charged at 5 per cent that this group's relative "per sheep" position declines. This is probably a combination of two factors. Firstly, among the many influences which determine prices of properties, size of property is quite important—the smaller the property, *ceteris paribus*, the more costly, usually, on a per-acre basis is its purchase price; this also helps to account for their low rate of return on capital. Secondly, the scale of the enterprise is not large enough to give sufficient spread to capital and other overhead costs.

A small property needs for instance almost as many buildings and machinery as a property in the 2,001-5,000 class and this is reflected, on a per-sheep basis, in a difference of about 1s. 6d. for depreciation in favour of the larger flock. Those Services costs which are overhead costs are correspondingly dearer per sheep on the smaller properties too. Contrary to expectation the intensity of land use on these smaller properties is less than on the larger ones; this is shown in Table 21 which is based on "sheep only" properties. The lower stocking on the smaller properties is in part determined by the fact that the percentage of improved properties is very low in this group.

TABLE 21  
*Stocking Rates\*: by Flock Size ("Sheep only" Properties)*

	501-1,000	1,001-2,000	2,001-5,000	5,001 and Over	Whole Sub-sample
Ewe Units per Standard Acre..	0.64	0.82	1.11	0.79	0.85

\* Calculated on total standard acres.

The largest size group, 5,001 sheep and over, shows higher returns per sheep (mainly due to sales of stud sheep and a higher proportion of cattle carried than other property sizes although cattle are still less than 3 per cent of sheep numbers) than any of the others but its costs per sheep are so much higher (almost entirely because of the larger amounts of hired labour employed) that at the Farm Income level its position is the worst of them all. Subsequently with capital charged at 5 per cent (and on each of these properties there has been recent expenditure on pasture improvement which has not as yet showed its full benefit on higher returns), these larger properties show a loss on a per-sheep basis. However, these properties are not running at a loss; after all, there is a Farm Income of nearly 10s. per sheep. It is merely that the high imputed capital value of the properties is only earning 2.2 per cent. The high capital costs on a per-sheep basis are accounted for by the fact that, as stated, there have been heavy outlays on pasture improvement and the stocking rate of only 0.96 per acre is therefore low in relation to this as more than 40 per cent of the total grassland on these properties is improved.

These large properties may show a relatively low return on capital because of high costs (arising from the incidence of hired labour) and more extensive systems with low grazing intensities but their problems would not be of a serious nature—certainly the financial stability of the properties is not threatened if future price-cost relationships are no more adverse than in 1959-60. Whereas, the properties in the 501-1,000 flock size group obviously have very serious technical and economic problems.

As pasture improvement shows such good dividends, more pasture improvement and greater intensification might seem the obvious solution for these smaller properties. This is not necessarily so, however, and, unfortunately, comparison within the 501-1,000 sheep size group, between improved and non-improved properties, was not possible as there were so few properties improved. (One out of ten in the 30 "sheep only" properties in the subsample and only four out of sixteen in the initial sample.)

Certain of these properties are restricted in development by severe capital shortage. In fact, 25 of the 50 sample properties were said to be held back by shortage of funds and 21 of the 25 graziers said the money, if available, would go into pasture improvement. However, eight of these graziers were not willing to try to borrow and, of the rest, only five of those who had approached the banks had been entirely refused—possibly because they were considered poor risks and not necessarily because of lack of loanable funds. The delayed returns and the costly nature of increased expenditure with pasture improvement have been described elsewhere<sup>9</sup> and this explains the attitude of those graziers who, though short of funds, are not prepared to try to borrow; the investment is considered too risky under present conditions and the possible returns too distant.

On the other hand, many of them are clearly not in a position to carry on as they are unless prepared to live at a very low level and with their capital showing a very poor return in view of the risk carried. The distribution of Farm Income (i.e., before any capital charge made) for the sixteen small flock size properties is shown in Table 22.

TABLE 22  
*Frequency Distribution of Farm Income for Sixteen Properties of  
501-1,000 Sheep*

Farm Income	Number of Properties
Less than £1 .. ..	2
£1—£500 .. ..	4
£501—£1,000 .. ..	4
£1,001—£1,500 .. ..	1
£1,501—£2,000 .. ..	4
£2,001 and over .. ..	1

<sup>9</sup> F. H. Gruen and R. A. Pearse, "Aerial Pasture Improvement in New South Wales", this *Review*, Vol. 26, No. 2 (June, 1958).

TABLE 23

*Frequency Distribution of Labour and Management Income for Sixteen Properties of 501-1,000 Sheep*

Labour and Management Income	Number of Properties
Less than — £500 .. ..	3
— £499 to £0 .. ..	3
£1 to £500 .. ..	6
£501 to £1,000 .. ..	2
Over £1,000 .. ..	2

After a 5 per cent charge on capital was made the distribution of Labour and Management Income was as shown in Table 23. The highest Labour and Management Income was £1,325. Several of these smaller graziers expressed a wish to move out but the problem of obtaining what they considered a fair price for the money sunk into the properties in more prosperous times delayed their final decision to do so. One grazier expressed the opinion that he knew he could make his money earn more elsewhere but he preferred to have it left sunk in the property as then it was highly illiquid and he could not live beyond his means by dipping into capital. But, on the whole, most of these smaller graziers were profoundly worried by their position and awareness of the need to pour a great deal of money into the properties if they are to survive and yet to have to do this at a time when the uncertainty of the wool market and wool prices is common talk.

It should not escape notice that the high returns shown on pasture improved properties may stem from the fact that graziers who have gone in for pasture improvement are possibly more go-ahead and capable than those who have not improved their properties. This generalization is not necessarily true for individual graziers in either camp but, on the whole, common sense suggests it would be so for each group viewed as a whole. Therefore, some of the higher returns shown by improved properties should be credited to management, and not capital, on the assumption that even without the improvement of pastures such properties under such occupiers would show higher returns than the remainder of the sample.

## 6. CONCLUSION

The survey indicates that stocking rates are not high in the New England taking into account the amount of pasture improvement. Although this may be in part due to the fact that—

- (a) flock sizes have not caught up with the improved acreages ;
- (b) just over 40 per cent of the improved acres are on properties having more than 8,000 sheep and therefore with no great need for intensification.

“Understocking” appears to be the deliberate policy of a good many graziers—mainly because of the shortage of winter feed. On the other hand, only a minority (one-fifth of the sample) buys feed regularly; on one-half of the sample properties fodder is bought as required and on the other three-tenths of the sample feed is never bought at all. Hay is only made on 12 of the 50 properties.

At the level of prices operating in 1959-60, properties of less than 1,000 sheep appear to be in serious trouble—and the 1960-61 national average price was nearly 6d. per lb. lower than for 1959-60. A Farm Income of less than 18s. 0d. per sheep does not generate a total Farm Income of sufficient size to give the grazier a reasonable reward for his labour and management nor to show any return on the capital locked up in wool production on the property. If a charge of 5 per cent is made against the imputed capital value of such properties, the Labour and Management Income is negative.

“Large” properties, i.e., those of more than 5,000 sheep, are even worse off at the Labour and Management Income level but this does not mean that the financial stability of these properties is threatened. It is merely that the heavy capital investments in the properties are earning at the rate of around 2½ per cent instead of the 5 per cent costed arbitrarily. Even with their high, hired-labour costs, these “large” properties have a Farm Income of more than 9s. per sheep and as the smallest of these flocks is of more than 8,000 sheep, the Farm Income is one which can provide, at its lowest estimate, good living standards for the occupiers and their families.

The small producer is in a very difficult position. Alternative enterprises are not possible on most of these properties. Intensification is required but it is difficult to see how this is to be achieved. Whether or not pasture improvement is the answer to the problems was not revealed by the survey data because for one thing, so few of these small properties had been improved and therefore no standards for comparison existed within the sample.

Pasture improvement has shown up very well through the sample as a whole; properties which were improved earning 3 per cent more on their total capital value than those not improved. Some part of this, however, may arise from better management. The greatest amount of pasture improvement had taken place on the large properties. The reasons for this could arise from:

- (a) more enlightened management;
- (b) less capital restrictions; or
- (c) the fact that these properties are less intensively stocked and therefore a greater proportion of the property could be improved in any one year.

The high capital expenditure necessary for successful pasture improvement and the delayed nature of its returns are well known to small producers and many of them are loath to put money (if obtainable) into such an investment venture when so much uncertainty surrounds the market for wool.

Nearly all these small producers are aware of the nature of their difficulties and yet do not want to have to leave the land. In many instances, they could not recover, by selling up, what they consider the equivalent value of money already sunk into the properties. Possibly their problems are more the concern of the sociologist and the politician rather than the agricultural economist.