Sheep Investigations at Shannon Vale Nutrition Station with Special Reference to Strategic Stocking

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SUMMARY

The results of 15 years' investigations at the Shannon Vale Nutrition Station on the Eastern Granite Country of New England, South South Wales, with dry adult sheep, lambs, weaners and breeding ewes (Merino and Crossbred) are presented and discussed. From these results and from pasture management investigations sufficient information is now available to design a pasture-animal routine capable of promoting better land use in terms of livestock health and production per acre.

I. INTRODUCTION

The Shannon Vale Nutrition Station was established in 1939 primarily to investigate sheep losses due to malnutrition on the Eastern Granite country of New England. Although the specific data cited here applies directly to this area, many of the principles of pasture and animal management which have emerged over the past fifteen years apply to areas other than that of which the Station is representative.

The first five years, covering a period of low soil fertility and small areas of sown pasture with little knowledge of its seasonal behaviour, were devoted to observations on dry sheep. The second period, beginning in 1945, was concerned with the breeding of Merino ewes and in 1951-52 a third and more intensive phase was begun. This involved sheep and pasture management designed to produce fat lambs from crossbred ewes.

The purpose of this paper is to describe the observations made during these periods, give them a value in terms of animal nutrition requirements and endeavour to evolve a method of relating these requirements to actual and potential pasture production.

II. DETAILS OF INVESTIGATIONS

(A) THE FIRST PHASE IN THE INVESTIGATIONS

(1) Mortality and Bodyweight Loss in Adult Dry Sheep.

A twenty-five to thirty per cent. bodyweight loss in winter, low wool production and a heavy mortality rate even in dry sheep, are characteristic features of sheep production on the natural pastures of the Eastern New England Granite country. Earlier observation had indicated that the cause was almost entirely nutritional (Hindmarsh and Blumer, 1937), and the initial investigations at the Station were directed towards the provision of supplementary winter feeds.

Groups of 2½ years' old sheep were subjected to the following treatments during the period 1940-44:

(a) Grazing natural pasture at the rate of 0.75 sheep per acre — control group.

(b) Mineral supplements. (i) dicalcic phosphate plus salt; (ii) drenching twice-weekly with trace element mixture; (iii) drenching with phenothiazine.

(c) Supplementary hand feeding at daily intervals: (i) 4 oz. coconut meal; (ii) 4 oz. cereal cubes; (iii) 4 oz. oil cubes; (iv) 1.5 oz. maize with or without salt; (v) 4 oz. maize; (vi) 8 oz. lucerne chaff; (vii) lucerne chaff plus oats.

(d) Grazing supplements and grazing variations from the control group: (i) rotational grazing on natural pasture — 0.75 sheep per acre; (ii)

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grazing natural pasture at 0.5 or 1.5 sheep per acre; (iii) grazing natural pasture top-dressed with superphosphate; (iv) grazing improved pasture at the rate of 2 sheep per acre; (v) grazing improved pasture for 2, 3 or 5 days per week at 2 sheep per acre and the remainder of the week grazing natural pasture at 0.75 sheep per acre; (vi) natural pasture plus access to turnips.

(2) Performance of Weaners.

In 1943 four groups of weaners were introduced in order to compare results with those from the older sheep. These animals were treated as follows:

(i) controls, natural pasture only; (ii) natural pasture plus mineral drenches; (iii) improved pasture for 3.5 days per week; (iv) improved pasture for 3.5 days per week plus a supplement of lucerne chaff, maize and sheep nuts, the aim being to produce a bodyweight gain of 1 lb. per head per week from April to October. In 1944 a group grazing natural pasture was given 1 lb. lucerne plus 4 oz. of maize or oats in an attempt to promote winter weight gains similar to groups grazing improved pasture for 3.5 days per week.

RESULTS

(1) Adult Sheep: Grazing on natural pasture at the rates of 0.5, 0.75 or 1.5 sheep per acre resulted in winter bodyweight losses of approximately 25 per cent., wool yields of 5.6 lb. per acre and a mortality rate of approximately 70 per cent. up to 1946. Rotational grazing, variation in stocking rates or mineral supplements gave no apparent improvement in performance. Supplementary feeding prevented bodyweight losses more or less in proportion to the nutritive value of the supplements given. In all cases, however, the cost of the supplements more than offset the value of the rations, resulting in a lower net return than that from the control groups.

Grazing on improved pastures very largely prevented bodyweight losses, increased wool production by 3.5 lb. per acre and, up to 1946, when the initial sheep were 8.5 years old, the mortality rate was only 13 per cent. of the original numbers. Net return over the whole period was approximately twice that from the controls.

The results obtained with the various groups grazed for 2, 3 or 5 days per week on improved pasture were not markedly different.

The mean bodyweight changes over the six year period of the control group and the groups grazed 2 days or 5 days per week on improved pasture are shown in Figure 1 (page 13). The winter bodyweight loss of the control groups contrasts with the improved pasture groups. This pattern was repeated regularly each year.

(2) Weaners: The performance of these groups was broadly the same as that of the adult sheep. Control groups were the same weight at shearing as at weaning. Grazing for 3.5 days per week on improved pasture resulted in a total winter weight gain of 7.6 lb. In addition to improved pasture grazing, supplementary feeding which cost 19/10d. per head resulted in a bodyweight gain of 16 lb. On the other hand supplements, costing 15/6d. per head, fed to weaners running on natural pastures did not promote bodyweight gains equal to those achieved on improved pasture alone for 3.5 days per week.

(B) THE SECOND PHASE

(1) Breeding Performance of Merino Sheep.

The performance of dry sheep grazing improved pasture during the first phase of the investigations suggested that a breeding programme might be initiated with reasonable expectation of success. In addition, the bodyweight performance of adult sheep (fig. 1) suggested there might be an advantage in altering the lambing date from that usually practised in New England.

In 1945 two-year-old flock ewes from the Trangie Experiment Farm were divided into four breeding groups:

(i) September lambing with the ewes grazing natural pasture at the rate of 0.75 sheep per acre; (ii) November lambing and grazing as in (i); (iii) September lambing with ewes grazing for 3.5 days on improved pasture at 2 sheep per acre and 3.5 days on natural pasture at 0.75 sheep per acre; (iv) November lambing and grazing as in (iii).

All progeny grazed under the same conditions as their dams and data were obtained on lambing percentages, ewe and lamb mortalities and wool production. Observations were continued into the F1 and F2 generations.

RESULTS

Group (i): After three years only 66 per cent. of original ewes plus their progeny had survived. The weaner progeny were very slow in developing and had produced no progeny up to 1948 when they were discarded.

Group (ii): There was a slight increase in total population of this group after four years. Ewe mortality was lower and wool production was slightly greater than in group (i). Weaner development, however, was equally slow.

Groups (iii) and (iv): Breeding performance of ewes in these two groups was much better than that of ewes in groups (i) and (ii). The results are summarised in Table 1.

TABLE 1: Breeding Performance of Maiden and Post-Maiden Ewes Grazing for 3.5 days per week on Improved Pasture.

	September Lambing (means of 9 mated groups)	**November Lambing** (means of 11 mated groups)
Post Maiden Ewes		
Lambs born (%)	90.5	86.9
Lambs weaned (%)	68.8	75.9
Lambs lost between birth and weaning (%)	21.7	11.0
Maiden Ewes.		
Lambs born (%)	77.7	52.2
Lambs weaned (%)	59.5	48.0
Lambs lost between birth and weaning (%)	18.2	4.0
Ewe mortality, adults and maidens	6.26	2.63

Maiden ewes lambing in November cut 0.49 more wool than those lambing in September. With post-maiden ewes the margin in favour of the November lambing ewes was 0.15 lb.

(2) Performance of Progeny from Breeding Programme as Weaners and Subsequently as Maiden Ewes, 1948-1954.

The performances of the September and November-born ewe lambs from the ewes in the breeding programme above are shown in Tables 2 and 3.

TABLE 2

TABLE 2: Bodyweight Performance of September and November born Ewe Lambs Grazing Natural Pastures only or 3.5 Days per Week Improved Pastures.

Pasture Treatment	Month of Birth	Bodyweight at 6 weeks of age	Bodyweight at 4.5 weeks of age	Winter Bodyweight Gain Apr. 2 — Oct. 7	Mean Total Bodyweight Gains Dec. 21 — Apr. 29	
		(lb.)	(lb.)	(lb.)	(lb.)	(lb.)
Natural pasture only	Sept.	16.6		0.0	19.4*	
	Nov.		19.6	2.8		27.6†
3.5 days improved pasture	Sept.	23.6		7.0	33.0*	
	Nov.		25.7	8.8		37.6†

*September born lambs aged 19 months on April 29.

†November born lambs aged 17 months on April 29.

TABLE 3: Bodyweight Increase of Ewe Weaners from Janunry following Birth to end of Winter of same Year when Grazing for 3.5 Days per Week on Improved Pasture.

Month of Birth	1945-48 (38 weeks)	1949 (37 weeks)	1950 (33 weeks)	1951 (32 weeks)	1952 (34 weeks)	Mean
	(lb.)	(lb.)	(lb.)	(lb.)	(lb.)	(lb.)
September	17.0	14.0	12.1	14.6	17.2	15.0
November	20.8	17.6	16.0	18.3	28.7	20.3

At a stocking rate of 2 to 3 weaners per acre the annual mortality was 0.3 per cent. during the period 1946-1952.

The ewe weaners developed sufficiently when grazing for 3.5 days per week on improved pasture to be mated at 18 months of age in contrast to the usual mating age of 2.5 years. The data are shown in Table 4.

TABLE 4: Effect of 3.5 or 7 Days per Week Grazing on Improved Pastures on Weaning and Mating Weights of Merino Ewes.

	Month of Lambing	3.5 Days per Week Improved Pasture		7 Days per Week Improved Pasture	
		Mean Bodyweight			
		Weaning	Mating	Weaning	Mating
		(lb.)	(lb.)	(lb.)	(lb.)
Lambs born to Maiden Ewes	Sept.	43.3	68.5	49.1	68.6
	Nov.	38.8	63.8	39.3	66.2
Post Maiden Ewes	Sept.	49.4	70.1	—	—
	Nov.	38.6	62.5	39.6	66.4

Irrespective of whether they were born in September or November and of differences in bodyweights at weaning, the progeny of maiden ewes were approximately the same weight when mated at 18 months of age. In addition, these progeny developed equally as well as did the progeny of post-maiden ewes.

(3) Early Weaning of Lambs

It was considered possible that some advantage might be gained by weaning lambs at an earlier age than that normally practised and in 1949 the following treatments were initiated:-

(i) Half of the lambs born in September were weaned at 3 months of age and half at 5 months.

(ii) Half of the November born lambs were weaned at 3 months of age and half at 4.5 months of age.

When weaned, all lambs were grazed full time on sown pastures for 3 weeks and then run together and grazed on improved pastures for 3.5 days per week.

The bodyweight gains from January following birth to approximately the end of the following September, of the lambs in the four weaning treatments during the 4 years from 1949 to 1952, are shown in Table 5.

TABLE 5: Bodyweight Increase of Lambs from January following Birth to end of following September when Weaned at 3 or 5 Months of Age.

Age at Weaning (months)	1949 (37 weeks)	1950 (33 weeks)	1951 (32 weeks)	1952 (34 weeks)	Mean
September born					
3	14.0	12.5	14.5	16.6	14.4
5	13.3	11.6	14.8	17.7	14.4
November born					
3	18.4	15.0	19.0	27.6	20.0
4.5	16.8	16.9	17.6	29.7	20.0

Weaning at 1.5 to 2 months earlier than the normal age did not materially affect subsequent growth of lambs as weaners.

(C) THE THIRD PHASE

(1) Seven Days versus Three and Half Days Improved Pasture Grazing.

In 1951 two flocks of ewe weaners were introduced and subsequently all ewe progeny were retained. One flock was grazed fully on improved pasture and the other for half the week on improved pasture and half on natural pasture.

The experiment was designed to obtain information on differences in growth of young sheep, differences in fertility, the economics of pasture restriction, the stages, if any, in a sheep's life when full time grazing of improved pasture could be beneficial, and finally the cumulative effects on subsequent generations.

To date results show that bodyweight differences though not great are most pronounced at the end of winter. Average greasy wool production by the flock fully grazed on improved pasture was increased by 0.5 lb., 0.86, 1.00, 0.94 and 1.27 lbs. in the hogget, maiden, 3rd, 4th and 5th years respectively over that of the flock grazed for only half the week.

The percentage of lambs weaned from the fully grazed flock increased by 30 per cent. in three maiden year, 5.2 per cent. for two second pregnancy years and 30.6 per cent. for the third pregnancy.

All post-maiden lambing occurred in November, but maidens were lambed in both September and November.

The percentage of lambs weaned from the November maiden lambing (earlier period 1945-51) showed a slight increase from 48.0 to 52.5 per cent., on the 3.5-day sown pasture routine, but rose to 70.2 per cent. under the 7-day system.

The studies on F1 and F2 generations are not yet far advanced but figures to date indicate appreciable cumulative gains in body and wool weight.

(2) Pre-Mating Nutritional Levels.

During the period 1953 to 1955, the depression of nutritional levels until 3 weeks prior to mating, followed by flushing for 3 weeks before and for 3 weeks into the mating season, with the introduction of vasectomised rams, yielded an increased percentage of lambs born of 14.4, 9.4 and 11.8 per cent. respectively for the three years.

Market lamb raising posed difficulties in conception similar to those encountered in Merino breeding. Mid-May mating yielded 100 per cent. lambs, mid-June 80 per cent., and mid-July 50 per cent. The later lambing is desirable in respect of supplying the late autumn-early winter supply gap, and greater attention to nutritional levels has increased the lambing percentage to 90 per cent. for mid-November lambing.

(3) Pasture Management.

An early series of analyses showed the winter protein content of sown pasture to be 4 times greater than that of the Natural pasture — for the summer period the ratio was 2:1.

During the period 1940-51 pastures were sown as a general mixture, and subjected to continuous winter stocking at a fixed rate. From 1952 onwards, management has changed greatly. Planned up to a year in advance, specific paddocks have been allotted to accommodate specific sheep operations (e.g., weaning, flushing, pre-lambing build-up, etc.). The paddock selection was based on the normal productivity of the dominant species at the time of the sheep operation involved, and the paddocks were prepared for their projected use by a programme of mowing, cattle grazing, manuring and spelling. A particular paddock may be allotted perhaps three strategic functions during the year; frequently additional tactical grazings are obtained, according to the bounty of the season.

Treated in this manner, most paddocks are stocked for only one third of the year. Records for sample paddocks during 1955 showed:

Paddock 7: 13 sheep per acre for 145 days = 5.1 sheep/acre/annum
Paddock 14: 16.6 sheep per acre for 122 days = 5.5 sheep/acre/annum
Paddock 13: 13.0 sheep per acre for 97 days = 3.5 sheep/acre/annum

Modifications of normal productivity are now being made by (a) segregation of the grass species; cocksfoot, perennial ryegrass and **Phalaris tuberosa,** each with its appropriate clovers; (b) autumn saving of selected paddocks for late winter use.

Paddock 6B, ryegrass dominant, was closed to grazing on 12.5.55. Over a period of 26 days from 29.7.55 to 23.8.55, in the critical late winter, it carried 17 ewes per acre, and, after 3 weeks' spelling (not considered necessary from a feed sufficiency angle), 7 ewes per acre for a further 15 days.

The heaviest spring and autumn grazing has been allotted to perennial ryegrass dominant paddocks, the late spring, early summer and early winter grazing to Phalaris dominant paddocks, and mid to late summer and mid to late winter grazing to cocksfoot dominant areas. During two winters cocksfoot has shown a much more marked resistance to frost than the other species, and also has shown good drought resistance in a dry mid-summer.

III. DISCUSSION

The results during the 15 year period from 1940 to 1955 may be selectively grouped and interpreted in respect of their effect upon land use.

Since adequate nutrition can, in New England, shorten by a year the time taken to bring a young ewe to high productivity, that is a lamb and good wool cut at 2 years of age, she should have first call upon available nutrient resources to provide a steadily increasing plane of nutrition from weaning to maiden lambing.

Response to this plane, on a 3.5 days' sown pasture grazing routine, is not adversely affected by late spring birth or by weaning at three months of age.

Bodyweight differences, at this hogget stage, resulting from higher or lower levels of nutrition are not necessarily an index of expected fertility and wool production. For example, the bodyweight difference at June 1 st (critical as the mating date) between hoggets on 7 days and 3.5 days sown pasture treatments was 4.25 lb., but 28.0 per cent. more lambs were born under the 7-day routine. The opportunity offered for ingestion of twice the quantity of protein, itself four times as great as that contained in winter natural pasture, could be considered responsible for more rapid sexual maturity, and for the wool cut increase of 0.86 lb.

The nutritional stress for young sheep is continuous and gradually increasing. From weaning until maiden lambing it covers the full calendar year, and, therefore, cannot be accommodated by manipulation of the animal routine.

Breeding ewes can support, and even benefit by variable nutritional levels throughout the year. Provided the minor stress of 3 weeks' pre-mating feeding, and the major stress of 6 weeks' pre-lambing build up and of lactation are catered for, a maintenance level is adequate for the remainder of the cycle. Provision of a nutrient level higher than maintenance for adult ewes, as given in the 7 days' sown pasture treatment, yielded appreciable lamb and wool increases, but the cost, in terms of twice the area of sown pasture involved, could be more profitably directed towards carrying twice the number of ewes on the 3.5 days per week routine. There is, therefore, with this section of the flock, opportunity for transferring the heavier nutritional stresses to the periods of seasonal pasture productivity best able to support them.

The gain in wool yield and the reduction in ewe mortality attending the late spring (November) lambing is attributed to such postponement of the major nutritional stress. So also, for the most part, is the net gain in lambs reared, although the pre-lambing shearing in October could exert some influence.

Winter feed in late July, August and early September, is difficult to achieve by any method, and maximum use should be made of it.

These responses to differential treatments, for both animal and pasture, may be integrated into a system of strategic stocking.

The principles involved are:—

1. Discrimination in the nutritional levels offered to different sections of the flock at their various functional periods — adequate and priority feeding where growth and development are involved, and avoidance of waste in heavy feeding where such is not necessary.
2. Exploitation. Firstly of the seasonal productivity levels of the different pasture species to extend pasture grazing resources and secondly, within species, of the principles of grass growth and species characteristics. It calls for pasture management which will permit heavy usage at times critical to the animal; this, in turn, presumes the conception of paddocks as individual units, with their own characteristics, rather than as pasture area in general; the corollary is long-term planning of their use and finally conservation of surplus growth.

The indicated procedure presupposes acceptance of a less than maximum level of production per head; this is mainly in respect of wool growth, where the maximum yield can only be obtained at a disproportionate cost in terms of available nutritional resources. The gain derives from greater output per acre by virtue of heavier carrying of females (and, therefore, progeny) fed at nutrient levels which vary according to their functional needs.

The manipulation of the calendar incidence of these functional needs, to integrate with available pasture resources, themselves exploited and modified to the maximum, constitutes the **modus operandi** of strategic stocking.

Application of the principle of mutually fitting animal requirements and pasture resources (for any set of district conditions) can be shown pictorially. In the histogram in figure 1 is shown the strategic feed requirements (in food units per head) for 100 breeding ewes, and below it, and to the same scale, the concurrent requirements for an 80 per cent. lamb production. When superimposed, they express the simultaneous ewe and weaner requirements since the incidence of one determines the incidence of the other. Placed against the graph of pasture productivity they can illustrate, by advanced or retarded positioning, the period of best synchronisation. Similar histograms can be prepared for . requirements of other types of sheep.

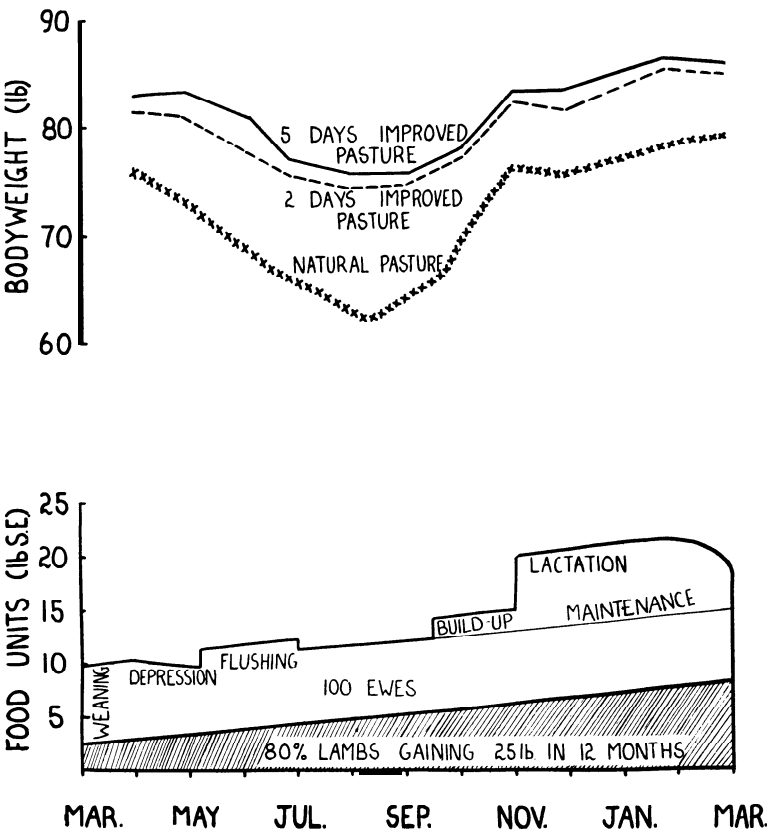

FIGURE 1: Upper: Mean bodyweight performance during 6-year period 1940-1945 of adult dry Merino sheep grazing natural pasture only, or natural pasture plus 2 or 5 days per week grazing on improved pasture.

Lower: Annual strategic feed requirements per head of 100 breeding ewes and the concurrent requirements for an 80 per cent. lamb production.

The benefits conferred by strategic placing of the main nutritional stresses may be illustrated in several ways:-

(a) The wool increase for the mean of three maiden shearings, following 7 days' improved pasture grazing as against 3.5 days, was, for September lambing, 0.86 lb.; fifty-five per cent. of this increase (0.49 lb.) was obtained, still on a 3.5 days basis, by adoption **per se.,** of November lambing.

(b) The Southdown x Romney Marsh lamb project not only incorporates the general advantage arising from deferment of nutritional stress but illustrates its value when directed towards a specific end, namely, the late autumn market.

(c) The nutritional significance of the deferment of lambing and of early weaning can be expressed thus:—

Early weaning permits a reduction for 7 weeks, of ewes from lactation status (14 food units) to maintenance (7 food units), i.e., a saving of 4,900 food units per 100 ewes which would then be available for other purposes. Late spring lambing permits postponement from mid-July to mid-September of 6 weeks' pre-lambing build-up at 9 food units plus 2 weeks' lactation at 14 food units (at a time when pasture resources are at their lowest), and substitution of maintenance status at 7 food units, that is, a sparing of 2,600 food units.

The total food spared (7,500 units) is adequate for provision, at maintenance level, of an additional 20 ewes (per 100) for 53 weeks.

The present method of approach at the Station is to dissect the operations of the various sheep groups (e.g., weaning, mating, lambing, fattening), allot these groups to specific paddocks, selected on the normal expected productivity at the period of the operation involved, and prepare these paddocks a year ahead, in respect of spelling, manuring, mowing, cattle use or autumn saving.

Each paddock is thus allotted certain specific functions for the year which are carried out at high stocking rates; the planned movements of each sheep group can be traced from paddock to paddock for a year ahead.

However, the allotment to a paddock of 2, 3 or 4 strategic grazing periods to accommodate specific sheep operations does not necessarily preclude its being used for other "tactical" grazings should the season be suitable: it is merely a safeguard to ensure that these particular sheep operations are catered for. Provided the spelling periods necessary to achieve the major purposes are maintained, many subsidiary grazings are frequently possible and often necessary. For example, one paddock was planned to carry 96 sheep for 95 days, giving an annual stocking rate of 3.84 sheep per acre. Actually 89 sheep were grazed for 145 days, equivalent to 5.1 sheep per acre per year. In most paddocks, however, grazing for approximately one-third of the year, at an average rate of 15 sheep per acre, has yielded good overall results.

The extent of spelling periods varies with the time of the year; in mid-spring and early summer, and again in early autumn, 3-weekly periods have been found to be sufficient; for the winter much longer periods, merging into the use of "saved grass" have been necessary. This, having made its full growth including root development, suffers no check by being grazed down heavily at the end of winter, and is conditioned for quick growth in the spring.

From the viewpoint of strategic stocking, a good case can be made out for modification of the usual recommendations for sowing pasture species (i.e., ryegrass on the best, well-watered soils, **Phalaris tuberosa** on less fertile soils, and cocksfoot on the harder ridges) and substituting for them the different species balanced for their period of productivity, with some disregard of soil types.

The mechanics of plotting the year's paddock arrangements have been described elsewhere (Cotsell, 1953). Very briefly, paddock use and sheep movements are plotted on a continuous roll, marked off horizontally as a calendar and vertically as a list of paddocks. Grazing and spelling periods, mowing, manuring, cattle use are mrked in, and any departures subsequently found necessary or advisably superimposed. Each successive year's recording is based largely upon performance in preceding years and tends to build up a fairly accurate assessment of the paddock capacity.

The process calls for considerable thought at the time of planning but, in compensation, the problem of the movements of the various sheep groups is, in the main, disposed of for the following 12 months.

IV. REFERENCES

Cotsell, J. C. (1953). Pastoral Review 53: 467-8, 584-5, 704-6, 821-2.

Hindmarsh, W. L., and Blumer, C.C. (1937). Vet.Res.Rep., N.S.W., No. 7, pp. 15-37.

DISCUSSION

Mr. JOHNSTONE: Maiden ewes lambed later cut more wool but there were also more dry ewes. This fact might account for the increased weight of wool.

ANS.: Pointed out that this was not altogether the position. Maiden ewes lambing in October still cut 0.5 lb. more wool.

Miss TURNER: Was there any difference in the performance of maiden ewes born at different times of the year?

ANS.: Differences were not considered.

Mr. KNIGHT: Can Mr. Cotsell draw any conclusions to date from the use of teaser rams during the period of flushing upon the subsequent lambing performance in Merinos?

ANS.: No. The use of teasers and flushing have been combined.

Mr. ALLDEN: Were any observations made on the causes of neo-natal mortality, and were there any differences in mortality between ewes in the wool and those out of the wool?

ANS.: A drop in the incidence of preganancy toxaemia was noted in the later lambing ewes. However, no direct observations were made.

Mr. BARRETT: Was the increased percentage of lambs born in the "flushed" group due to an increase in the number of twin births, or was it due to an increase in the actual number of ewes which lambed?

ANS.: More ewes conceived. There was no greater number of twins.

Mr. JOHNSTONE: What would happen if lambing was carried out in October?

ANS.: Intermediate results probably but we did not lamb in October because sheep were shorn this month.

Mr. McKENZIE: Have ewes lambed in wool or off shears?

ANS.: Ewes have always lambed off shears except with September lambings in which ewes lambed in wool.

Mr. J. F. Barrett, C.S.I.R.O., Armidale, in commenting on the practices of lambing ewes in wool or off shears, gave details of an experiment at Chiswick. Three hundred ewes were mated and divided into two groups each of 150. One group was lambed in wool and one group off shears. The average percentage of lambs marked over 4 years from each group was: off shears 81, in wool 78 per cent. Average number of lambs died as a percentage of lambs born was: off shears 12, in wool 15.2 per cent. At Chiswick there is virtually no difference between lambing in wool or off shears.