

# LINCOLN COLLEGE

(CANTERBURY AGRICULTURAL COLLEGE)

SCHOOL OF AGRICULTURE  
UNIVERSITY OF NEW ZEALAND



## *Land Utilisation on Ashley Dene Farm*

*Survey of Work Done 1937 to 1946*

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## FOREWORD

The Survey description of the Ashley Dene Farm is as follows:—

R.S. 4742 4973 5116 5880 7393 8787 Pt. Rs. 3247.

Block V1 Leeston Survey District.

Area: 878 acres.

The property was part of the original 1,246 acres granted to Bethell and Treadwell in 1864-65. From Bethell it passed to J. Palmer in December, 1893, the price paid being £6,600. J. Palmer then sold to E. V. Palmer in 1905 from whom J. McCrostie bought it in the same year for £11,200. Four years later (1909), McCrostie sold 870 acres to the College for £8,267. Five acres in the South East corner of R.S. 3247 were sold off in 1913, leaving 865 acres. The Cemetery reserve of 15 acres was not at that time included in the area, but later two acres were fenced off for cemetery, leaving 13 acres which, together with the 865 acres, gives the present area of 878 acres.

In 1906 the Government valuation was:

Capital Value .....	£7,910
Unimproved Value .....	£6,090
Improvements .....	£1,820

Improvements included:—

Dwellings (20 years old) .....	£980
Farm Buildings, etc. ....	£140

The property is reported as being well grassed and fenced.

In 1937 the Government valuation was:—

Capital Value .....	£7,195
Unimproved Value .....	£5,150
Improvements .....	£2,045

Details of the unimproved value were:—

118 acres (Homestead block) @ £12/10/-	£1,475
254 acres (Cemetery block) @ £5/10/-..	£1,397
506 acres (Main block) @ £4/10/- .....	£2,277
	<hr/>
	£5,149

Over the last eight years, the property has been progressively developed. The purpose of this survey is to record the various changes which have taken place together with a review of the management methods which have been introduced.

## RESEARCH WORK—PADDOCK 18.

During the period covered in this survey experimental work has been carried on by the College in conjunction with the Department of Scientific and Industrial Research. Much of the information gained from this work has proved of immediate value in determining the top dressing policy adopted on the Ashley Dene farm.

### INTRODUCTION

The College property, Ashley Dene, consists of 878 acres, situated about seven miles South-west of the College itself. There are on the property three main types of soil, each located approximately on one of the three blocks of which the farm is comprised. Two of these blocks, with an area of about 760 acres, are of the "light land" soil type so widely found on the Canterbury Plains. The third block is of heavier deeper soil.

The original cover was tussock and danthonia, providing sparse herbage for grazing stock. In the early days of settlement the country produced wool and store sheep, but as time went on the grazing policy was modified by the introduction of forage crops, combined with the running of sheep. The main crops grown were turnips and other forage with oats for chaff and grain.

The fall in the demand for oats, as the horse was displaced by mechanised power, has reacted adversely on this class of land as the oat crop was the main source of cash crop revenue.

Attempts to replace this lost revenue by wheat growing are not satisfactory as yields are not only low, but are notoriously uncertain. Further, such crops lower the fertility of the land so that the grazing capacity of subsequent pastures is seriously jeopardised.

On smaller holdings of this type the position of farmers has been most difficult and over the last fifteen or twenty years many of these properties have failed. Farmers on more extensive areas have, under modified management, been able to carry on. One such system of modification is outlined in the accompanying survey.

It is not suggested that the method of land utilisation described is the only one suitable for converting this type of country from "marginal" to reasonably stable farming, but to those interested in light land, it may present some ideas worthy of application to their own problems.

## GENERAL DESCRIPTION OF PROPERTY—SCOPE OF WORK UNDERTAKEN

Up till 1938 Ashley Dene was worked as a more or less independent unit although originally it had been intended that some College stock should be wintered on the Ashley Dene farm, should conditions at Lincoln be too wet. Of late years very little interchange of stock on pre-arranged plan has taken place.

The system of management followed for years on Ashley Dene was typical of that still followed today on many light land farms. It has developed as a result of the climatic and soil conditions prevailing on country of this type.

The property carried approximately one ewe per acre with extensive cultivation for forage crops and oats for chaff, the work being done by a 6-horse team. The ewe flock was maintained by the annual purchase of 2-tooths or four year old ewes. No systematic study of the farm accounts was made, and it has not been possible to separate the Ashley Dene from the main College accounts. Little, if any, profit could have resulted from the operating of the property.

In 1937 a review of the position was made by the present Director of the College, Professor E. R. Hudson, and it was decided to use Ashley Dene as an area on which to test out the possibility of increasing the productivity of the lighter plains land of Canterbury by modified methods of management. Initial steps were taken in the autumn of that year, and the work has gone on since that time. This survey is presented for the purpose of describing the activities over the eight-year period, and of discussing the various points in management which have arisen.

## CLIMATE

An examination of the rainfall figures shows that the average precipitation for the last eight years has been 28 inches. This rainfall is on the whole fairly uniformly distributed on an "average" basis, but the effectiveness of the rain is greater during the period March to November than during the summer months, when the north-west winds cause excessive evaporation of soil moisture.

The prevailing wind throughout the year is from the north east, but it is the violence of south westerly and north westerly gales which chiefly affects production, and from which shelter is required for stock, crops and pastures. The southerly winds are particularly dangerous in August

and September, when lambing is in full swing. The nor-wester is a hot, dry wind, often reaching gale force and drying the land so rapidly that forage crops, and pastures may be reduced to a wilting condition in a few days; often, as a result of this wind, droughts may be experienced of from three to five months' duration, during which forage crops sown for autumn and winter use fail, and pastures of ryegrass and white clover are dessicated—often beyond recovery. This effect is heightened in intensity because of the unretentive nature of the soil.

### SOIL TYPES

The areas of the main soil types are shown on the accompanying plan.

There are approximately 40 acres on the eastern and southern end of the Homestead block where much of the soil is 6 inches of silt loam over 8 to 10 inches of clay over shingle. The southern end of paddocks 3, 4 and 5 is poorly drained and about 10 acres are waterlogged for the greater part of the year.

The remainder of the block—70 acres—together with a strip of about 170 acres of the western section of the Cemetery block is of clay loam 6 inches deep with some shingle, overlying deep shingle; much of this area is subject to undercurrent flooding.

There is an area of deep sandy soil which runs from the centre of paddock 11 in an easterly direction along the southern side of paddock 12 and included in it are the cemetery and an area of a few acres at the eastern end of paddock 10.

The rest of the Cemetery block (approximately 80 acres) and the 506 acres of the Main block is essentially typical light land of the Canterbury Plains which is a thin soil mixed with shingle over deep "running" shingle.

Summarised, the areas are:—

Approximately 40 acres of heavier land capable of carrying a permanent pasture of ryegrass-white clover and of growing wheat.

Approximately 30 acres of sandy soil which grows sub clover well.

Approximately 200 acres of medium-light soil which grows good sub-clover and is satisfactory for oat crops and a very occasional crop of wheat.



Approximately 600 acres of typical light plains land on which perennial pasture species do not remain permanently but on which, with care, and time, good subterranean clover swards can be established.

Apart from the Homestead block of heavier soil, all the land is subject to drought and grass grub attack.

The depth of soil influences the productivity of any land and the combined effect of the dry summer climatic conditions and the thin open nature of the soil over most of the farm is such that cropping results are uncertain, and the perennality of pastures limited. As a result of these two factors the area sown in forage crops for wintering the ewes, fattening the lambs and providing chaff for both horses and sheep, was extensive. At the same time the need for constant pasture renewal made extensive ploughing up and re-sowing imperative.

### **Undercurrent:**

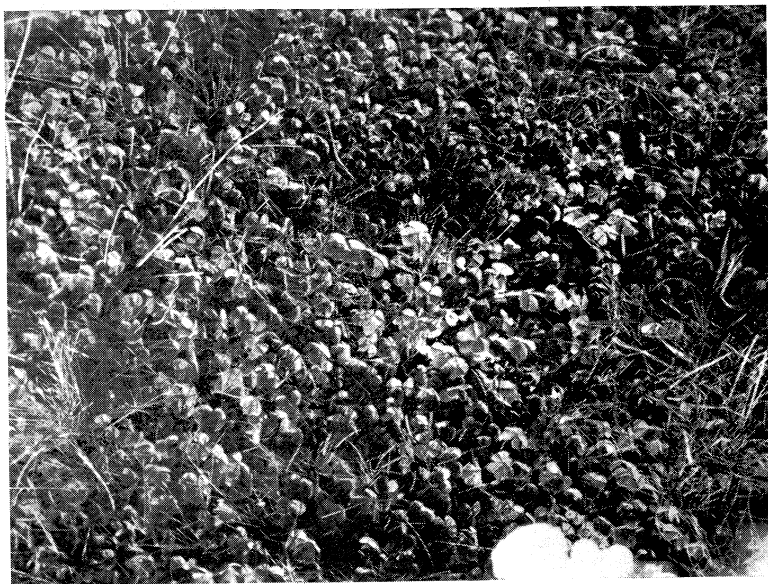
Much of the south western portion of the Cemetery and Homestead blocks is subject to "undercurrent" flooding. While the damage done by undercurrent may not be serious on the poorer types of pastures, it is most detrimental to lucerne, and in the two years during which it was most marked, 1939 and 1945, the lucerne was adversely affected; more so in the latter year when the extent and duration of flooding were more serious. In addition cultivation on this section of the property has been held up for months owing to this type of flooding. In 1945 it was estimated that 80 acres were affected to some degree with undercurrent, which interfered not only with cultivation but also with topdressing and the cutting of lucerne hay.

### **Note:**

Undercurrent flooding is common in Canterbury on areas where light shingle country lies adjacent to an area of impervious silt. The underground streams flowing through the shingle strike the impervious silt and emerge as artesian outbreaks to flood the surface of the surrounding country. These floods are uncertain and unpredictable as to severity, time of occurrence, and duration. They thus constitute a considerable farming hazard in those districts where "undercurrent" is normally experienced.



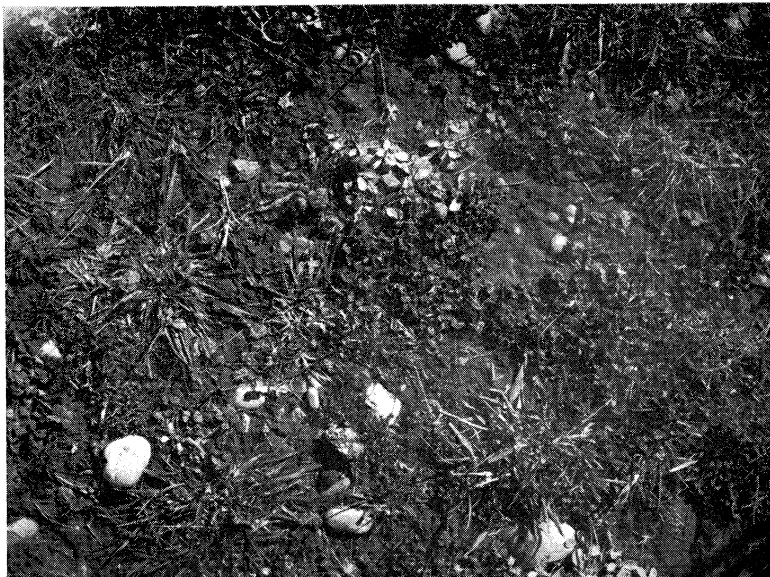
Typical Brown Top dominant sward. main block, 1939. Pad. 14.  
A turf of this type renders the successive surface introduction of sub. clover  
a difficult matter.



Four-year Sub. Clover Pasture, 90% Clover with 10% Hairgrass.



Two-year Sub. Clover on light stony land. Pad. 19. Successful surface introduction 1937-38.



Sub Introduction on run-out pasture. Brown Top dominant 40%, Graphalium 10%, Bare Ground 30%, Sub. 20%. Paddock 17, two years after Surface Introduction—not successful.

## PASTURES AND CROPPING

Originally the standard grass seed mixture, 25-30lbs rye (Perennial and Italian) 4lbs broad red, 2 lbs white clover, was sown; the life of the resulting pasture would vary from two to four years, after which with the decline of the better species, browntop, sweet vernal, hairgrass (*V. Bromoides*) and haresfoot trefoil would come in to replace them.

A typical cropping programme under this system of management was as follows:—

Turnips—out of grass 80 acres (approximately).

Rape after turnips, 50 acres.

Algerian oats after rape or green feed 80 acres.

Green feed and grass after oats 80 acres.

Green feed or rape and grass 30-40 acres.

The total area cultivated was approximately 300 acres per annum. The pastures were laid down with rape or with green feed. These pastures would flourish for two years, but beyond that their life was limited owing to drought, grass grub and porina, the latter being severe in some years. No system of topdressing was practised because of the short duration and uncertainty of the pasturage. The sources of revenue from the farm were wool and fat lambs and occasionally oats or oaten sheaf chaff. On this class of country, yields from cash crops are irregular, but where cultivation is imperative for forage crops there is often opportunity for fitting a cereal crop into the rotation before sowing back to grass.

## PROPOSALS FOR MODIFICATION OF MANAGEMENT

In 1937 proposals were based on four main points:—

1. The substitution of a crude oil tractor for horses.
2. The replacement of oaten chaff as winter dry feed for the ewe flock by lucerne hay grown on the property.
3. The attempt to develop permanent pastures by the use of subterranean clover as the dominant species.
4. Reduction of the area under the plough annually.

By means of these changes it was hoped that eventually the carrying capacity of the property might be so increased that revenue would overtake expenditure and so place the property on a better financial basis. If the experiment should prove to be reasonably successful it

might then be used as a means of demonstrating how better use might be made of the extensive areas of land similar to Ashley Dene.

There was sufficient evidence offering to indicate that each of the steps taken was a practical possibility; tractors were replacing horses throughout Canterbury and the crude oil type gave promise of cheap working. Problems associated with the growing of lucerne in Canterbury had been investigated by the College and success of the crop was practically guaranteed. Subterranean clover had been established on a number of farms in North Canterbury, and its behaviour under sound management indicated that increased carrying capacity could be expected in much the same way as has been experienced in Australia.

The yearly steps taken in the implementing of the policy are set out in the accompanying tables which show the progressive stages in the establishment of subterranean-clover-dominant pastures on the Cemetery and Main blocks and of lucerne and permanent rye-white clover pastures on the Homestead block. (Note: Reference to map will show the location of these blocks.)

The order of cropping for each year is also given together with a summary of land utilisation—in general terms—for that year.

It will be noted that pastures of subterranean clover are classified as good, fair and poor. These terms are used to give a comparative idea of the sward qualities and are based on the yearly spring inspections. In this inspection an “eye estimation” of the clover and grass cover was made and the swards classified on the following:—

70% Cover (or over), good.

40-70% Cover, fair.

Under 40% Cover, poor.

For purposes of this survey this method is considered to be sufficiently accurate and it does give an adequate idea of the rate of improvement in the pastures from year to year.

### **Liming:**

Early trials showed that with lime the response of subterranean clover to superphosphate was greatly enhanced and for five or six years repeated lime dressings of 5cwt per acre were applied to the clover swards even when supplies of phosphate were limited through rationing. The main purpose has been to raise the lime status as quickly as possible; the quality of the pastures and the increased production per acre reflect this treatment.

## SUMMARY OF CROPPING, TOPDRESSING, ETC., YEAR, 1937-38.

NOTE: The year is taken: April 1st—March 31st in all cases.

CROPPING AND CULTIVATION				TOPDRESSING, ETC., OF PASTURES			
Paddock	Area Acres	Crop		Paddock	Area Acres	Treatment	
3	15	New grass.	Perennial Ryegrass, White Clover, Red Clover.	14	52	Surface introduction.	Sub. Clover.
5	20	Oats for chaff.		17	42	4lbs. per acre.	Super 1cwt. per acre.
7	12	Lucerne, newly established.		18	87	" "	" "
8	34	Turnips.		19	61	" "	" "
12	36	Green feed Italian Ryegrass.		20	24	" "	" "
15	50	Turnips failed through drought.	Green feed and Sub. Clover sown in early March.	22	32	1cwt. Super.	per acre.
16	35	Rape and grass.	(Sub. Clover in Autumn).				
16	20	Sub. Clover sown on fallow.					
20A	21	Green feed Oats and Sub. Clover.					
	243				298		

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### Summary: Of 1937-38 work.

Cropping and cultivation.	243 acres
Lucerne establishment.	12 "
Surface introduction of sub. clover.	266 "
Topdressing of sub. pasture.	32 "
Stock carried.	865 ewes

### NOTE:—

Of this year's surface introduction, paddocks 18, 19 and 20 were successfully established while 14 and 17 were only partially so.  
This work was done in March, 1937, but for record purposes has been included in the 1937-38 programme.  
Paddock 22 was established the year previously under oat crop.

**Abbreviations:—**The abbreviations "Sub" and "Super" for "Subterranean" and "Superphosphate" are introduced in the text at this stage. They are sufficiently well recognised in Agricultural parlance for this to be admissible.

# SUMMARY OF CROPPING, TOPDRESSING, ETC., YEAR, 1938-39.

CROPPING AND CULTIVATION			TOPDRESSING, ETC., OF PASTURES		
Paddock	Area Acres	Crop	Paddock	Area Acres	Treatment
5	20	Wheat.	1 (House)	3	2 cwt. Super. 5 cwt. Lime per acre.
6	24	Newly established Lucerne.	3	15	1 " " 10 " " " "
7A (Part)	5	Newly established Lucerne.	9	30	1 " " 5 " " " "
8	34	Oats for chaff.	14	52	1 " " 5 " " " "
9A	30	Turnips.	16	55	1 " " 5 " " " "
12	36	Oats and Peas (Hay). Turnips and grass with Sub. Clover. (January sowing).	17	42	1 cwt. Super per acre (3lbs. Sub. Clover per acre Surface introduced).
17A	39	Rape and grass with Sub. Clover (Autumn sown).	19	61	1 cwt. Super 5 cwt. Lime per acre
21	39	Oats for chaff.	20	24	1 " " 5 " " " "
			20A	21	1 " " 5 " " " "
			22	32	1 " " 5 " " " "
					(Perennial Ryegrass @ $\frac{1}{2}$ bus. per acre Surface introduced).
	<u>227</u>			<u>335</u>	

## Summary of 1938-39 work:

Cropping and cultivation.	227 acres
Lucerne establishment.	29 " (total area now 41 acres)
Surface introduction:	
(a) Sub. Clover.	42 "
(b) Per. Ryegrass.	32 "
Topdressing of pastures.	335 "
Area in good sub. clover pasture.	52 " (Nos. Pt. 16 & 22)
Area in fair sub. clover pasture.	106 " (Nos. 19, 20, 20A)
Area in poor sub. clover pasture.	209 " (Nos. 8, 14, 15, pt. 16, 17)
Stock carried.	900 Ewes

## NOTES:—

**Paddocks 14, pt. 16 and 17:** These showed a limited scattered growth of sub. clover. It was hoped that treatment with lime and super, might accelerate the rate of establishment. This hope was not realised. Notes on this are given later on.

**Paddock 3** saved for ryegrass seed.

### Reduction of area farmed:

Paddock 18 was set aside for experimental plots. From now on the effective farm area is approximately 800 acres.

## SUMMARY OF CROPPING, TOPDRESSING, ETC., YEAR, 1939-40.

CROPPING AND CULTIVATION			TOPDRESSING, ETC., OF PASTURES			
Paddock	Area Acres	Crop	Paddock	Area Acres	Treatment	
2	11	Kale.	1 (House)	3	1 cwt. Super.	5 cwt. Lime per acre
5	20	Greenfeed Oats.	3	15	1 " " "	10 " " " "
7A	5	Newly established Lucerne.	9	30	1 " " "	5 " " " "
(part)			12	36	1 " " "	5 " " " "
8	34	Greenfeed.	14	52	1 " " "	5 " " " "
8A	32	Turnips.	15	50	1 " " "	5 " " " "
9A	30	Rape.	16	20	1 " " "	5 " " " "
11	15	Oats.	17	42	1 " " "	5 " " " "
16	35	Greenfeed Oats (sown with Sub.	19	61	1 " " "	5 " " " "
(part)		Clover).	20	24	1 " " "	5 " " " "
21	39	Greenfeed Oats and new grass.	20A	21	1 " " "	5 " " " "
			22	32	1 " " "	5 " " " "
				386		
	221					

Summary: Of 1939-40 work.

Cropping and cultivation.	221 acres	
Lucerne establishment.	5 " (total area now 46 acres)	
Topdressing of clover paddocks.	386 "	
Area in good sub. pasture.	158 " (Nos. Pt. 16, 19, 20, 20A, 22)	
Area in fair sub. pasture.	116 " (Nos. 9, 12, 15)	
Area in poor sub. pasture.	133 " (Nos. 14, 17 and 17A)	
Stock carried.	1,140 ewes	

### NOTES:—

**Paddock 16.** Thirty-five acres had been sown after rape and grass; the sub. clover failed to establish. It was resown with greenfeed. In contrast, the 20 acres at the western end of this paddock which was sown with sub. clover on fallow is an excellent sward.

**Paddocks 14 and 17:** These paddocks showed some improvement and were topdressed a second time. No. 17 showed further improvement but No. 14 where there was a strong *agrostis* turf failed to show clover development. No further topdressing was done and this paddock was duly ploughed and finally re-established satisfactorily.

**Paddock 9:** Sub. clover had been sown in this paddock in 1934 but with indifferent success. No topdressing until 1938. It has shown definite thickening up of clover.

**Paddock 3:** Saved for White Clover seed.

**Breeding Policy:** This year 600 ewes were mated to the Corriedale ram to breed replacements.

**Horses replaced by tractor:** During the year team was sold; Lanz Bulldog (Model L) bought May, 1939. There was, at the same time, a change over to tractor drawn implements.

Horses and horse implements sold.



# SUMMARY OF CROPPING, TOPDRESSING, ETC., YEAR, 1940-41.

CROPPING AND CULTIVATION			TOPDRESSING, ETC., OF PASTURES		
Paddock	Area Acres	Crop	Paddock	Area Acres	Treatment
2	11	New grass. Per. Rye, White Clover.	1 (House)	3	2 cwt. Super. 5 cwt. Lime per acre.
5	20	New grass. Per. Rye, White Clover.	3	15	2 " " 10 " " " "
8	34	New grass and Sub. Clover.	5	20	2 " " 20 " " " "
8A	32	Rape.	12	36	1 " " 5 " " " "
9A	30	Green feed.	16 (Part)	20	1 " " 5 " " " "
11	15	Oats for chaff.			(Ryegrass surface introduced).
13	41	Turnips and Bitter Blue Lupins.	17A	39	1 " " 5 cwt. Lime per acre.
			19 (Part)	10	1 " " 5 " " " "
			20A	21	1 " " 5 " " " "
					(Ryegrass surface introduced).
			21	39	1 cwt. Super. (Sub. Clover surface intro- introduced).
			22	32	1 " " 5 cwt. Lime per acre.
	183			235	

## Summary:

Cropping and cultivation.	183	acres
Surface introduction:		
(a) Sub. Clover.	39	"
(b) Per. Ryegrass.	41	"
Topdressing of pastures.	235	"
Area in good sub. pasture.	227	" (Nos. 12 (part), 16, 19, 20, 20A, 21, 22)
Area in fair sub. pasture.	122	" (Nos. 9, 15, 17)
Area in poor sub. pasture.	103	" (Nos. 12 (part), 14 and 17A)
Stock carried.	1,025	ewes

## NOTES:—

### Surface introduction of Perennial Ryegrass.

This proved successful in Paddock 22 in 1938. 16 and 20A where clover pasture was good were worked up in February with the one-way disc—ryegrass at  $\frac{1}{2}$  bus. per acre was drilled. Establishment was good.

### Sub. Clover introduction, Paddock 21.

The pasture mixture sown in previous year did not include sub. clover so surface introduction at 5lbs. per acre was carried out. Establishment of sub clover was very good.

### Reduction in Stock Numbers.

The carrying of 1,140 in the previous year appeared to be on the high side, typical of the trial and error incidental to stock carrying estimations on this country where grazing capacity under sub. clover was practically unknown. The easing of stocking gave the newly and recently established pastures a chance to thicken up and thereafter stocking increased annually.

## SUMMARY OF CROPPING, TOPDRESSING, ETC., YEAR, 1941-42.

CROPPING AND CULTIVATION			TOPDRESSING, ETC., OF PASTURES				
Paddock	Area Acres	Crop	Paddock	Area Acres	Treatment		
8A	32	Oats for chaff; followed by greenfeed oats and grass with Sub. Clover, sown in February, 1942.	1 (House)	3	2 cwt. Super.	10 cwt. Lime	per acre.
			2	11	2 " "	20 " "	" "
			3	15	2 " "	10 " "	" "
9A	30	Sweet Blue Lupins for seed.	4	10	2 " "	10 " "	" "
11	15	Barley.	5	20	2 " "	20 " "	" "
13	41	New grass with Sub. Clover (sown on fallow).	8, 9, 12, 15, 16, 17, 17A, 19, 20, 20A, and 22	424	1 " "	5 " "	" "
14	52	Turnips and Bitter Blue Lupins.	21	39	1 " "	10 " "	" "
	<u>170</u>			<u>522</u>			

### Summary:

Cropping and cultivation.	170	acres
Topdressing of pastures.	522	"
Area in good sub. clover	382	" (Nos. 8, 9, 12, 15, 16, 19, 20, 20A, 21 and 22)
Area in fair sub. clover.	81	" (Nos. 17 and 17A)
Area in good Rye/White.	49	" (Nos. 1, 2, 3 and 5)
Area in indifferent pasture	42	" (Nos. 4 and 10)
Area in lucerne.	46	" (Nos. 6, 7 and 7A)
Stock carried.	1,170 ewes	and 305 ewe hoggets

### NOTES:—

**Paddock 14** which was a dominantly brown top turf was ploughed for turnips.

**Paddock 3:** Saved for White Clover seed.

**Summer Rape:** No rape was sown this year. Lambs were fattened on lucerne. The results were satisfactory, but liable to be detrimental to lucerne if practised consistently, and so far rape has not been omitted again from the rotation. It is possible that "grazing lucerne" may be used to advantage for lamb fattening. Trials of this variety are in progress (1946).

**Stock:** Ewe hoggets for flock replacement were carried this year for the first time. Corriedale two-tooths bred on farm, but reared at College, introduced to the flock; in subsequent years all 2-tooth ewes bred and reared on farm.

# SUMMARY OF CROPPING, TOPDRESSING, ETC., YEAR, 1942-43.

CROPPING AND CULTIVATION			TOPDRESSING, ETC., OF PASTURES			
Paddock	Area Acres	Crop	Paddock	Area Acres	Treatment	
3	15	Linen Flax.	1 (House)	3	1 cwt. Super.	5 cwt. Lime per acre
9A	30	Green feed Lupins and Oats, sown with Phalaris tuberosa, White and Sub. Clover in February.	2	11	2 " "	10 " " " "
			4	10	1 " "	10 " " " "
			5	20	1 " "	10 " " " "
11	15	Green feed Oats and Italian Rye.	8	34	1 " "	10 " " " "
14	52	Rape and Sweet Blue Lupins.	9	30	1 " "	10 " " " "
17	42	Turnips.	12	36	1 " "	5 " " " "
			13	41	1 " "	10 " " " "
			15	50	1 " "	5 " " " "
			16	55	1 " "	5 " " " "
			19	61	1 " "	5 " " " "
			20A	21	1 " "	5 " " " "
			22	32	1 " "	5 " " " "
	154			404		

Summary: Of 1942-43 work.

Cropping and cultivation.	154	acres
Topdressing of pastures.	404	"
Area in good sub. pasture.	382	" (Nos. 8, 9, 12, 15, 16, 19, 20, 20A, 21, 22)
Area in fair sub. pasture.	80	" (Nos. 17A and 18)
Area in poor sub. pasture.	32	" (No. 8A)
Area in good Rye/White pasture	34	" (Nos. 1, 2 and 5)
Area in indifferent pasture.	42	" (Nos. 4 and 10)
Stock carried.	1,411 ewes, 286 ewe lambs	

## NOTES:—

**Paddock 3:** Linen flax sown in this paddock yielded approximately 3 tons per acre.

**Paddock 8A:** Sown after oats—promised well, but strong nor'-west winds in March severely reduced the density of the clover stand and at no time did it develop past the "only fair" stage.

**Paddock 9A:** Phalaris tuberosa established in order to test the value of this grass as being winter green and resistant to drought, grass grub, and porina.

**Paddock 14:** Sweet Blue Lupins grown in association with rape. It would appear that the fertility of this land is below the requirements of the lupin crop as it contributed little to the lamb fattening feed provided by the rape.

**Paddock 17** had improved considerably but was at no stage good all over; the south side adjacent to shelter was good but the northern portion was only fair.

**Stock:** This year the Romney ram was mated to the Corriedale ewes; the aim is to produce a three-quarter bred ewe thought to be better suited for the production of "milk" lambs.

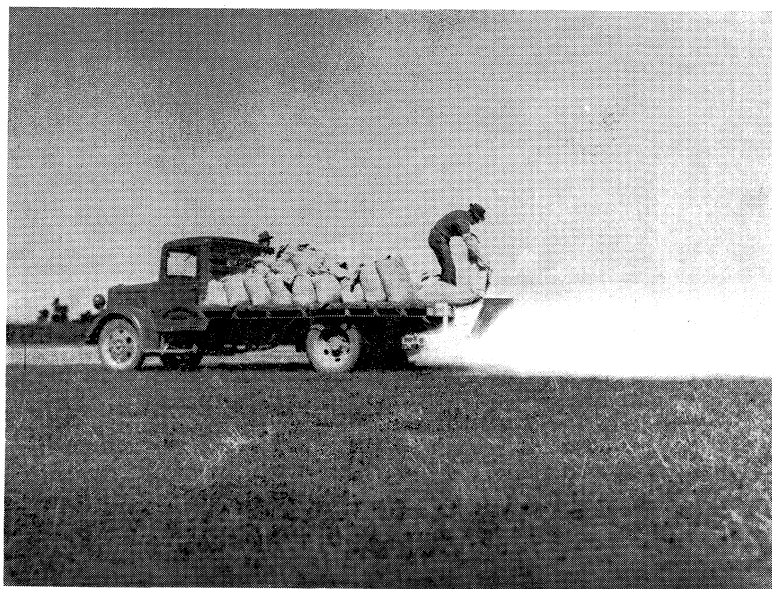


First year drilled pasture. Pad. 14.

Note the high percentage of bare ground: this disappears as the sub. clover runners spread their seed over the whole area.



The same sub. clover pasture three years old. Pad. 14.



Top-dressing Sub. Clover pasture.



Loading Lucerne Silage.

## SUMMARY OF CROPPING, TOPDRESSING, ETC., YEAR, 1943-44.

CROPPING AND CULTIVATION			TOPDRESSING, ETC., OF PASTURES						
Paddock	Area Acres	Crop	Paddock	Area Acres	Treatment				
3	15	Wheat.	1 (House)	3	1 cwt. Super	5 cwt. Lime	per	acre	
10	32	Turnips and Bitter Blue Lupins.	8A	32	1 " "	5 " "	"	"	"
11	15	Greenfeed Italian Ryegrass.	12	36	1 " "	5 " "	"	"	"
14	52	Greenfeed Italian Ryegrass to new pasture.	13	41	1 cwt. Super	5 cwt. Lime	per	acre	
17	42	Rape—followed by greenfeed Italian Ryegrass.	19	61	1 " "	5 " "	"	"	"
			20A	21	1 cwt. Super	5 cwt. Lime	per	acre	
			21	39	1 " "	5 " "	"	"	"
			22	32	1 " "	5 " "	"	"	"
	<u>156</u>			<u>265</u>					

### Summary: Of 1943-44 work.

Cropping and cultivation.	156	acres
Topdressing of pastures.	265	"
Area in good sub. clover.	423	" (includes No. 13)
Area in fair sub. clover.	39	" (No. 17A)
Area in phalaris and clover.	30	" (No. 9A)
Area in Rye/White pasture.	44	" (includes No. 4)
Stock carried.	1,417	ewes, 384 lambs

### NOTES:—

Reduction in super. allocation and area topdressed consequently restricted. It would appear, however, that there was a considerable "carry over" from previous years as the older pastures continued to flourish.

Paddock 4 is very wet and hard to drain. The topdressing has given marked response in the rapid development of white clover.

Paddock 8A: Topdressed in the hope that it might thicken up. Response was not very great, the pasture remaining open and patchy.

No. 10: This is the last of the paddocks to be broken out of old pasture sown without sub. clover.

Paddock 11 (part): Saved for ryegrass seed.

Paddock 14: Resown in autumn to new pasture—should from now on be a good sub. paddock.

Paddock 17: Rape crop was poor and bulk of lambs (600) were fattened on lucerne.

## SUMMARY OF CROPPING, TOPDRESSING, ETC., YEAR, 1944-45.

Paddock	Area Acres	Treatment	Paddock	Area Acres	Treatment
3	15	Greenfeed followed by new grass.	8	34	1 cwt. Super. 10 cwt. Lime. per acre
8A	32	Turnips and Bitter Blue Lupins.	12	36	1 cwt. Super. " "
10	32	Rape and S.B. Lupins.	13	41	1 cwt. Super. 5 cwt. Lime. " "
11 (Part)	7	Lucerne.	14	52	1 " " 20 " " " "
17	42	New grass and Sub. Clover.	15	50	10 " " " "
17A	40	Turnips and Bitter Blue Lupins.	16	55	10 " " " "
			20	24	1 " " 10 " " " "
			22	32	1 " " " "
	<hr/> 168			<hr/> 324	

Summary: On 1944-45 work.

Cropping and cultivation.	168 acres
Topdressing of pastures.	324 "
Area in good sub. pasture.	423 "
Area in other good pasture.	121 " (Nos. 2, 4, 5, 9A & 14)
Area in lucerne.	46 "
Stock carried.	1,525 ewes, 422 ewe hoggets

### NOTES:—

Paddock 9A saved for White Clover seed.

Paddock 11: After greenfeed seven acres of this paddock were sown with *Medicago glutinosa*, one of the prostrate lucernes. This area is established to investigate the possibilities of this plant under grazing.

All the clover pastures this year look particularly well. The whole farm area under grazing carries a good sward. Future ploughing for forage crops will be of good clover paddocks where the fertility should be much higher than was common in the past.

Stock: Three-quarter bred Romney Cross two-tooth ewes introduced into flock.

## SUMMARY OF CROPPING, TOPDRESSING, ETC., YEAR, 1945-46.

Paddock	Area Acres	Crop	Paddock	Area Acres	Treatment			
8	34	Fallow for Wheat.	3	15	1 cwt. Super	10 cwt. Lime.	per acre	
8A	32	New grass and Sub. Clover.	9A	30	1 " "	20 " "	" "	" "
9	30	Fallow for Wheat.	11 (Part)	7	1 " "	10 " "	" "	" "
10	32	Newly sown Lucerne.	12	36	1 " "	10 " "	" "	" "
17A	40	Rape followed by greenfeed.	17	42	1 " "	20 " "	" "	" "
20	24	Turnips and Bitter Blue Lupins	19	61	1 " "	10 " "	" "	" "
20A	21	Turnips and Bitter Blue Lupins.	21	39	1 " "	10 " "	" "	" "
			22 (Part)	10	1 " "	" "	" "	" "
	213			240				

### Summary: 1945-46.

Cropping and cultivation	213	acres
Topdressing of pasture.	240	"
Sub./dominant pastures.	408	"
Phalaris and sub.	30	"
Rye/White pastures.	59	"
Lucerne (inc. No. 11).	53	"
Stock.	1,652	ewes, 480 hoggets.

### NOTES:—

**Paddocks 8 and 9:** Wheat is being grown in response to appeal for greater area. This will provide information as to the advisability of taking off an occasional crop when the land has been under clover and topdressed for some years.

**Paddock 8A:** From "only fair" sub. pasture followed by turnips and lupins this paddock has been sown back to ryegrass and sub. clover. The strike of grass and clover on fallow is very good.

**Paddock 9A:** Saved for light crop of White Clover. This has been followed by attack with grass grub which should test the capacity of phalaris to survive.

**Paddocks 20 and 20A:** Sown with turnips in November-December. The dry weather in January retarded growth and crops will be light. There is, however, a remarkable strike of sub. clover demonstrating how re-establishment occurs.

**Pastures:** All carry a very good sward of clover.

**Lucerne:** The old lucerne area established 1937-38 is reverting to White Clover and weed grasses. It will continue to provide good grazing and some hay for another few years. The newly established 32 acres in No. 10 will provide the main source of hay after 1946 until a further area is sown.



# **LAND UTILISATION AT END OF PERIOD UNDER REVIEW, 1st APRIL, 1946**

## **Cropping and Cultivation:**

Turnips and Lupins .	45	acres (Nos. 20 & 20A)
Greenfeed .	39	„ (No. 17A)
Fallow for wheat .	64	„ (Nos. 8 & 9)

## **Pastures:**

Good sub. dominant pastures . . .	366	„ (Nos. 12, 13, 14, 15, 16, 19, 21, 22)
Poor sub. dominant pastures . . .	42	„ (No. 17)
Phalaris pasture with clover . . .	30	„ (No. 9A)
Good Ryegrass/White Clover pasture .	60	„ (Nos. 1, 2, 3, 4, 5)
Newly sown pasture rye and sub. .	32	„ (No. 8A)
Newly sown lucerne .	32	„ (No. 10)
“Grazing” lucerne .	7	„ (No. 11 part)
Poor Italian Rye .	8	„ (No. 11 part)
Old lucerne .	46	„ (Nos. 6, 7, 7A)
Experiment plots .	87	„ (No. 18)
Plantations, etc. .	20	„

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878 acres

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## REVIEW OF SUB. CLOVER PASTURE ESTABLISHMENT

Throughout the period under review the efforts to secure good sub clover pastures on the light land have followed all the standard methods for establishment of pastures as we see them in Canterbury today. These may be summarised as follows:—

1. Under oats grown for chaff or grain.
2. Under oats grown for green feed (on fallow).
3. On stubble following oats for chaff.
4. With rape.
5. After rape is fed off.
6. With turnips.
7. On fallow after green feed crop either alone or with grass.
8. By surface introduction on pasture in autumn.

Conclusions drawn from observations to date:—

1. **Under cereal grown for crop:** For the establishment of sub. clover this method is good provided the crop is sown not later than March. Later sowing may result in frost-lift of the clover. During the maturing and ripening of the cereal crop the clover plants are free to develop strong runners and set a considerable quantity of seed. Any ryegrass sown with the clover is liable to be badly thinned out after harvest owing to the dry condition of the soil—it may, therefore, be omitted at this stage and be surface introduced in a year or two when the clover is well established.

2. **Under cereal crop grown for green feed after fallow,** the establishment of sub. clover is good and the winter feeding off tends to prevent frost lift. The paddock must remain either ungrazed or very lightly stocked in November-December of that year to allow setting of the clover seed. This method is most effective if the green feed is sown on fallow or after rape. Restraint in grazing is not necessary in subsequent years.

3. **With green feed on stubble following a cereal crop** which has been harvested the results are not satisfactory unless immediately after cultivating the ground, the subsequent weather is such as to maintain the land in a good moist condition. This method may be regarded as less safe than others.

4. **With Rape:** This has not proved satisfactory for sub. clover as the feeding-off of the crop in January-February finds the sub. immature and the normal dry weather at the time prevents satisfactory seed setting.

5. **After Rape is fed off:** As with stubble sowing this method depends for its success on the autumn rainfall. The ground should be surface worked and the seed sown as early in autumn as possible on a firm seed bed; given good rains followed by an absence of drying winds the method is satisfactory.

6. **With Turnips:** This method proved quite satisfactory when the turnips were sown in December-January for winter feed. The clover shows no tendency to flower and die as is the case with the October rape sowing and the trampling incidental to winter feeding of the roots tends to prevent frost lift.

**On fallow after green feed:** This is a most satisfactory method and fits in well with the system of rotation now adopted on Ashley Dene, viz., grass, turnips and lupins, rape, green-feed-Italian ryegrass, fallow, sub. pasture.

**Surface introduction:** This method has been subjected to trial during the years under review and has proved satisfactory provided that:—

- (a) The ground is surface worked with the grubber, or one-way disc before sowing.
- (b) There is not a heavy Browntop turf. The experience gained indicates that the Browntop definitely prevents the young seedlings from gaining a roothold in the autumn. (See paddock No. 14).
- (c) The land has not been so over-cropped that the surface fertility is too low to allow a relatively vigorous growth of the clover in the first year. (See paddock No. 17).
- (d) The sowing is done before March so that the young seedlings have a good roothold before the heavy frosts begin. Later sowings have in all cases proved worthless.
- (e) There is ample February rain to allow of satisfactory surface cultivation.

The method which has given the best results and which is now adopted is that of sowing the pasture on fallow. But where oats are still grown for crop the under-seeding of the crop with clover seed is well worth adopting, especially when it fits in with the rotation: Grass, turnips and lupins, rape, oats and grass.

## METHOD OF SOWING SUB. CLOVER SEED

Special attention is directed to the drilling of sub. clover seed. It has been found that **shallow** drilling of the clover seed with 1 cwt. super, or reverted super. is essential for the best results. Hence when sowing with oats it is worth while to drill the oats, harrow and/or roll and then cross drill with the sub. clover, taking special care to avoid deep burying of the seed. Half the super. may be sown with the oats, the other half with the sub. seed.

## TOPDRESSING

Topdressing of sub. clover pastures is essential for success if heavy grazing swards are to be obtained. At the outset of the trials at Ashley Dene it was thought that super. alone, at the rate of 1 cwt. per acre was the best topdressing to apply. Subsequent work over the years has shown that lime is equally important and the combination, of both lime and super., is to be recommended. From results obtained so far two main methods appear to be satisfactory and economically practicable.

- (a) Five to ten cwt. of lime with 1 cwt. of super, at sowing time and thereafter 1 cwt. super. one year and 5 cwt. of lime the next, so applying super. and lime in alternate years.
- (b) An initial dressing of  $\frac{1}{2}$ -1 ton of lime at sowing time and then 1 cwt. super. biennially followed by 1 ton of lime every 5-7 years.

Note: Research into the question of topdressing is being continued.

## LUCERNE

Forty-six acres of lucerne were established on the Homestead block; this is one acre of lucerne for every 40 sheep on the farm. The establishment of the lucerne has followed the practice recommended for Canterbury by the College. The land may be cleaned by summer fallow. A green feed crop is sown in autumn; the land is ploughed about September/October, given a short summer fallow and the lucerne seed is sown on a well consolidated, clean, moist seed bed.

One ton of lime per acre is applied to the land prior to sowing which may take place in December, January or February as the season dictates.

Recent observations show that early spring sowing after a winter fallow is also a satisfactory method of establishing lucerne on this type of country.

## DETAILS OF SOWING

A sowing of 12-16 pounds of inoculated lucerne seed mixed with 2 cwt. of reverted super. is drilled very shallowly through all coulter, on a well rolled seed bed and then left without any further treatment.

In all, five distinct sowings (three on the Homestead and two on the Cemetery block) have been made during the period under review and all paddocks have been successfully established.

The crop provides both supplementary feed—silage and hay—and a certain amount of grazing as required. The first cut is taken in October and carted straight into the silage stacks. Subsequent cuts (normally two or three per annum) are handled by the pick-up baler. The average harvest over the last five years has been 100-120 tons of silage and about the same amount of hay. The aim is to provide one ton of hay for 15 ewes over the winter in addition to turnips and lupins, greenfeed Italian and such grazing as the pastures may yield. This objective has been reached in all years, although in the 1943-44 season the prolonged dry spell from November to February resulted in the failure of the rape crop, and the utilisation of the lucerne for lamb fattening. The carry-over from the previous year sufficed to provide the ewes' requirements in the 1944 winter.

## GRAZING OF LUCERNE

There are seasons when the lucerne may be called on for grazing (1) when the late spring growth of pasture finds the early lambing ewes short of feed; (2) when the early summer drought results in the last draft of lambs being in need of topping off feed owing to failure of the rape crop; (3) when retarded growth of green feed or pasturage in March may necessitate the use of lucerne in order to "flush" the ewes prior to mating. It would appear that the "life" of a lucerne stand is shortened by grazing and now after eight years, the paddocks sown in 1937-38 have passed their peak of production. Replacement with newly sown areas and resowing of the run out stands is now under way.

## ANNUAL TREATMENT

Topdressing of lucerne is carried out each August with 5 cwt. of lime to 2 cwt. super.

## THE PROVISION OF SUPPLEMENTARY FEED

There are three seasons of the year when supplementary crops are necessary:—

- (1) Summer: rape for lamb fattening.
- (2) Winter: turnips and Bitter Blue Lupins for supplementary forage; lucerne hay and silage.
- (3) Early Spring: greenfeed for the lambing ewes.

The area of these crops provided for the sheep depends on stock numbers and the following notes summarise the position:—

### 1. Summer Rape:

At the beginning of the work in 1937 it was hoped that with sub. clover dominant pastures a considerable increase in the lambs fattened and drafted off the mothers would result. Hence, although the number of lambs to be fattened, increased, the area in rape should not increase in the same ratio. At the moment, the cropping policy under trial is one based on the 40 acre unit—more or less—as the size of paddocks allows. Whether or not this area of rape will be adequate remains to be seen.

The number of lambs fattened off feed depends mainly on the weather and it will be seen from reference to the table on disposal of lambs that the percentage of lambs sold as stores varies from 1% in 1943-44 to 28% in 1938-39. (The term “Stores” applies to all lambs not sent to Works, and includes those sent to College for grazing of Fat Lamb forage trial areas).

On the average one might expect one acre of rape and lupins to fatten six to eight lambs per acre, and in the present scheme of management it is necessary to regard the area under lucerne as a subsidiary or complementary fattening crop—a role which it has filled admirably in years of rape shortage, e.g., 1941-42 and 1943-44.

### 2. Winter Feed—Turnips and Lupins:

For this crop Imperial Green Globe Turnips and Bitter Blue Lupins are used. The area sown annually is 40 acres (approx.).

Taking the whole flock as at present, 2,000 ewes and ewe-hoggets, the area of turnips provides one acre for 50 sheep.

On this country such provision is quite inadequate unless a prolific and sure source of some other feed is available. With the provision of lucerne hay at 1 ton per 15 sheep there is a reasonable margin of safety and the turnip crop

used for "on and off" grazing provides, with other green feed, sufficient succulence to balance the dry feed. During the winter 1941-42 the supply of winter forage was (owing to drought) far from adequate and the ewes were wintered almost entirely on lucerne hay and silage. They came through the winter in fairly good order. Since the introduction of the growing of green feed Italian Rye in the cropping system any ewes showing signs of pregnancy toxæmia disease are immediately transferred to the green feed and this normally checks the trouble.

### **Early Spring Feed:**

In order to make the best use of the sub. clover pastures it is necessary to lamb the ewe flock early in August. As this is ahead of normal spring pasture growth, 40 acres of Italian Ryegrass sown after rape plus 40 acres of new pasture sown on fallow, provides feed on to which ewes and lambs may be "drifted" as lambing progresses. Such paddocks of green feed, if they have not been heavily winter grazed, will provide three or four weeks' grazing while the permanent pastures are "picking up" their spring growth. In addition to the green feed Italian, further provision is made in most years by closing up two or three paddocks of sub. clover from May onwards. Such paddocks develop well in the next two or three months and "take up the running" as the green feed is consumed. On Ashley Dene as it is now, at least 80-100 acres of topdressed sub. pasture is closed up during the winter for the development of special purpose spring feed to be available for the ewes and lambs in August-September. As the general growth develops, the main pastures then carry their share of the stock so that by the time the lambs are themselves grazing, the flock is making use of the whole of the pasture area.

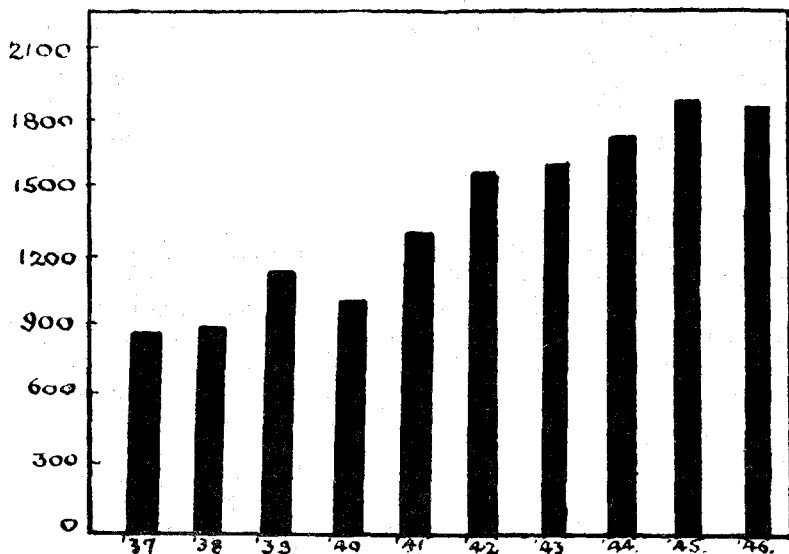
The *Phalaris tuberosa* pasture (Paddock 9A) is being winter spelled to determine its use as an early spring paddock for ewes and lambs. In the spring of 1945 this paddock, though far from being well established, appeared to "do" well the ewes and lambs grazing on it. More critical study of this, along with other special purpose pastures, will form the basis of pasture research on Ashley Dene in the next few years.

### **Other Crops:**

In addition to providing forage, the cultivation programme includes the growing of cash crops where this may

reasonably be done. The heavier land of the Homestead block and the western half of the Cemetery block are capable of producing occasional crops of wheat. As is recorded, oats and linen flax have also been grown and the saving of ryegrass and clover seeds in favourable seasons has added to the revenue. Whether any useful purpose would be served by exploiting the fertility of old established pastures on the Main Block by growing "white" crops is the subject of trials now in progress.

### THE EWE FLOCK



Stock carried yearly: Ewe equivalents.

Until April, 1944, all ewes on Ashley Dene were Corriedales, although bought-in Romney ewes had been used occasionally. In 1942, 600 were mated to the Romney ram and the  $\frac{3}{4}$  bred two-tooths have been introduced to the flock. This departure from pure Corriedales has been made because it is thought that the  $\frac{3}{4}$ -bred ewe is a better mother than the pure Corriedale—a point of importance when the rapid fattening of lambs for drafting off the ewes is a major consideration. The course being followed is: —



- (a) Corriedale ewes mated to Romney rams for the production of  $\frac{3}{4}$ -bred ewes.
- (b) Three-quarter-bred ewes mated to Southdown rams for the production of fat lambs.

With the progressive mating of replacement-flock-ewes with Romney rams, in time the whole flock would become almost pure Romney, tending more to the finer woolled than the coarser type. It may be necessary to re-introduce Corriedale blood, but the final type will be decided on as experience is gained and a guide to the behaviour of the different types of ewe is obtained.

In general, there is, in Canterbury, some prejudice against the maintenance of Romneys on this light land, it being considered that they fail to "do" as well as the Corriedales. The work on hand should provide some valuable information as to the validity of the argument, when the pasturage is of the dominantly sub. clover type.

### Lambing:

In autumn the ewes are sorted into two flocks of approximately the same number early in March. The better ewes are mated to the Romney ram; the remainder to the Southdown. The percentage of lambs marked to ewes mated averages out at 108% over the years reviewed. The highest figure recorded was 119% in 1942 when lambing weather was most favourable. With adequate feed provision, the climatic conditions at lambing time are the principle factor affecting the percentage. The planting of further shelter belts over the last six years, the provision of spring green feed and the maintenance of permanent pasture in those paddocks best adapted for lambing in rough weather, materially assist in guaranteeing a good percentage despite the cold southerlies of August and September.

Of the lambs dropped, approximately half are by the "Down" ram and half by the Romney. The management policy aims at drafting as high a percentage as possible of the "Down" Cross lambs fat off the mothers, together with wether lambs in the remainder, and fattening non-drafted lambs on rape (and lucerne where it is expedient). The success of this policy is dependent almost entirely on the weather, or, to be more explicit, on the precipitation/evaporation ratio at different seasons of the year. From November to March the north-westerly winds may be ex-

pected to blow with variable intensity. Should they reach gale force during this period, spring and autumn sown crops rapidly wilt and both rape for fattening and turnips for winter feed may be partially or wholly destroyed. In the same way, the early onset of these winds in November may cause the rapid wilting and desiccation of subterranean clover pastures on the light land of the Main and Cemetery blocks to such an extent that the ewes fail to hold their milk supply until weaning time. This results in a serious check to the lambs, and it is because of this that early drafting at lighter weights is sounder policy than holding over lambs which may be fit to kill at 32 lbs. in the hope of fattening them to heavier weights.

The percentage of lambs fattened off the mothers has for comparative purposes been based on total lambs dropped, irrespective of whether they are from the "fat-lamb-Down" flock or from the "replacement-Romney"-flock. For the 1943-44 season, observations showed that between 50% and 60% of the "Down Cross" lambs went out in the December-January drafts when approximately 500 lambs of the 1,000 fattened were sold. In the 1944-45 season only the heavier "Down Cross lambs" were sent away in the first draft, lighter weights being held in response to the Government's appeal for heavy lambs. Unfortunately, the season which gave promise of ample feed continued wet so that many lambs failed to fatten although there was no shortage of rape. In 1945-46 the lambing was good—109%—losses were very light, under 2%, and the growth of pastures was up to expectations. Of the 1,295 lambs sold fat, 862 went off the mothers at 33.5 lbs. and the remaining 433 averaged 34.5 lbs.—all were sold by 15/3/46, leaving 66 stores on hand after 410 ewe lambs had been retained for flock replacement. It is of interest to note that of the milk lambs sold, 87% were "Down" cross.

## DISPOSAL OF LAMBS 1937-38 TO 1945-46

Year	Ewes	Lambs	Lambing Percentage	Fats Sold off Ewes	Fats Sold off Feed	Stores	Deaths	Ewe Lambs Retained
1937-38	865	970	112%	415 (43%)	240 (25%)	273 (28%)	42 (4%)	Nil
1938-39	900	968	107%	445 (46%)	200 (21%)	276 (28%)	47 (5%)	Nil
1939-40	1,140	1,150	101%	325 (29%)	240 (22%)	269 (23%)	36 (3%)	280 (24%) (to College)
1940-41	1,025	1,063	103%	430 (40%)	280 (26%)	45 (4%)	13 (1%)	305 (29%)
1941-42	1,170	1,330	114%	441 (33%)	517 (38%)	50 (4%)	32 (2%)	290 (23%)
1942-43	1,411	1,670	119%	608 (36%)	285 (16%)	360 (22%)	33 (2%)	384 (24%)
1943-44	1,417	1,437	101%	490 (34%)	478 (33%)	16 (1%)	31 (2%)	422 (30%)
1944-45	1,525	1,693	111%	*176 (11%)	764 (45%)	178 (11%)	94 (6%)	480 (27%)
1945-46	1,652	1,801	109%	862 (48%)	433 (24%)	66 (3%)	30 (2%)	410 (23%)
Average 9 years.			108.5%	34.6%	28.4%	12.7%	3%	25% (7 yrs.)

\* In 1945 two trucks only of the heaviest lambs were sent in first draft in response to demand from Government for more meat. These lambs killed 38.24 lbs. and at least two or possibly three trucks of prime lighter weights could have been sent away at the same time. In January wet conditions were experienced: lambs did poorly—losses on feed were the highest on record.

The most profitable lamb is that sold "off the mother"; on this type of country prime or first grade light weight lambs 32/34 lbs. seem to yield the optimum return. It is because of this that lambing in August has been adopted in the hope that with early spring feed from greenfeed Italian Ryegrass, plus specially saved pastures, it will be possible in most seasons to carry the ewe and her lamb on pasture till early January, taking the first draft of lambs before Christmas and the second at weaning time after New Year. Experience over the next five years should show how successful such management may be.

## DETAILS OF FLOCK MANAGEMENT AND RECON- CILIATION OF FLOCK NUMBERS, 1937-46

1937-38:

Ewe flock 1st April, 1937.	865
Losses to 1st April, 1938.	24
Ewes sold to 1st April, 1938.	406
Ewes bought.	465

**Balance 900**

1938-39:

Ewe flock 1st April, 1938.	900
Losses to 1st April, 1939.	64
Ewes sold to 1st April, 1939.	159
Ewes bought.	463

**Balance 1,140**

1939-40:

Ewe flock 1st April, 1939.	1,140
Losses to 1st April, 1940.	49
Ewes sold to 1st April, 1940.	279
Ewes bought to 1st April, 1940.	213

**Balance 1,025**

This year 280 ewe lambs were retained and grazed at the College. For purposes of record these are treated as sold as ewe lambs in March, 1940, and bought in as two-tooths March, 1941.

1940-41:

Ewe flock 1st April, 1940.	1,025
Losses to 1st April, 1941.	22
Ewes sold to 1st April, 1941.	106
Ewes bought (2-ths ex C.A.C)	273

**Balance 1,170**

This year 305 ewe lambs were retained on the farm.

1941-42:

Ewe flock 1st April, 1941.	1,170	and 305 ewe lambs.
Losses to 1st April, 1942.	40	and 13 ewe lambs.
Ewes sold to 1st April, 1942.	249	
Ewes bought.	238	

Balance: 1,119 ewes and 292 ewe hoggets.

This year 286 ewe lambs were retained on the farm.

1942-43.

Ewe flock 1st April, 1942.	1,411	and 286 ewe lambs.
Losses to 1st April, 1943.	78	14 ewe lambs.
Ewes sold to 1st April, 1943.	285	and culled 10 ewe lambs.
Ewes bought.	107	

Balance: 1,155 ewes and 262 ewe hoggets.

This year 384 ewe lambs were retained on the farm.

1943-44:

Ewe flock 1st April, 1943.	1,417	and 384 ewe lambs.
Losses to 1st April, 1944.	78	17 ewe lambs.
Ewes sold to 1st April, 1944.	561	33 ewe hoggets.
Ewes bought.	369	44 ewe hoggets.

Balance: 1,147 ewes and 378 ewe hoggets.

This year 422 ewe lambs were retained on the farm.

1944-45:

Ewe flock 1st April, 1944.	1,525 and 422 ewe lambs.
Losses to 1st April, 1945.	74      15 ewe lambs.
Ewes sold to 1st April, 1945.	425
Ewes bought.	219

Balance: 1,245 ewes and 407 ewe hoggets.  
This year 480 ewe lambs were retained on the farm.

1945-46:

Ewe flock 1st April, 1945.	1,652 ewes and 480 ewe lambs.
Losses to 1st April, 1946.	55 ewes      28 ewe lambs.
Ewes sold to 1st April, 1946.	437 ewes      20 ewe hoggets.
Ewes bought.	88 ewes

Balance: 1,248 ewes and 432 ewe hoggets.  
This year 408 ewe lambs were retained on the farm.  
Flock numbers 1st April, 1946: 1,680 ewes.  
408 ewe hoggets.

**Rams:** No ram flock is carried, the rams being "hired" annually from the College. It will be noted in the statement of expenditure that a charge of 2½ gns. per annum is made for this service.

## THE WOOL CLIP

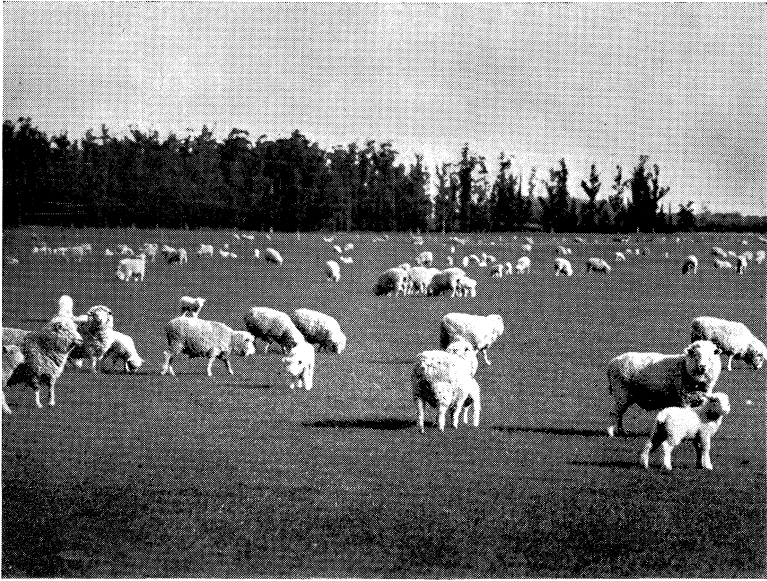
The average yield of wool over the period 1937-46 is approximately 9 lbs. per head for the ewes. The hogget clip has not been ascertainable owing to the fact that they were not shorn separately in the earlier years. Further, in 1943 the ewe lambs were shorn and the two-tooths were not thereafter shorn separately.

However, records have been kept of the experimental flock running on Paddock No. 18 and the hoggets here clipped an average of 8.75 lbs over six years.

The actual wool yield from the property is set out in the accompanying table:—

Year.	Number Shorn.	Total Clip lbs.	Value £	Area Acres.	Yield per Acre lbs.	Return per Acre.
1937-38	840	7,600	442	878	8.8	10/-
1938-39	880	7,950	470	878	9.0	10/6
1939-40	1,106	9,954	581	800	12.4	14/6
1940-41	1,004	9,126	531	800	11.4	13/4
1941-42	1,415	12,296	726	800	15.4	18/1
1942-43	1,631	14,371	990	800	17.8	24/3
*1943-44	2,054	20,169	1,160	800	25.2	29/-
*1944-45	2,324	22,996	1,278	800	28.7	31/9
*1945-46	2,201	19,120	1,087	800	24.0	28/6

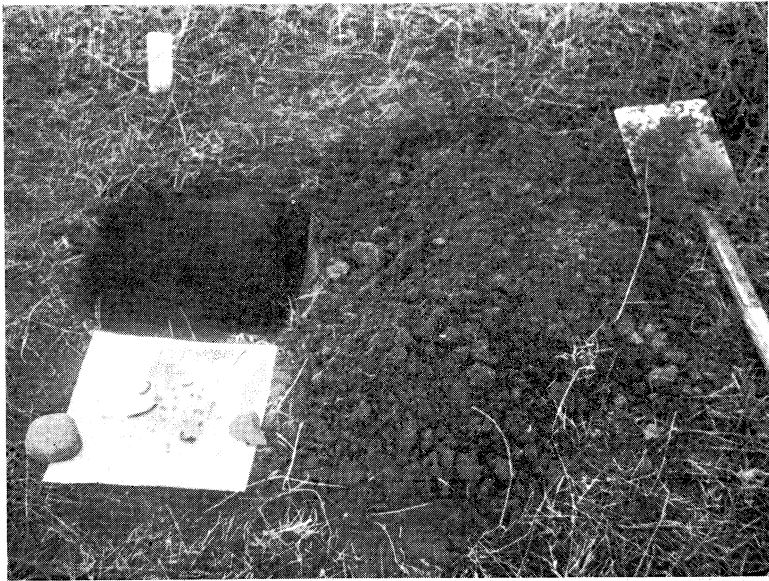
\*Includes lambs (only 2/3rd lambs shorn 1945-46).



Corriedale ewes with lambs by Romney ram.



Three-quarter bred ewes with lambs by Southdown ram.



Grass grub attack: twenty grass grubs, five porina per square foot. Pad. 9A.  
This was a heavy infection: the average of a number of examinations was  
8 grass grubs and 1 porina per square foot.



*Phalaris tuberosa*. Pad. 9A: this pasture plant withstood severe attack  
by grass grub and porina.

## **SHEARING OF LAMBS**

For the two years (1943-1944) the ewe lambs retained for flock replacement were shorn. In 1945 it was decided to investigate the effect of differential treatment. Three groups of lambs were (a) shorn with blades, (b) shorn with machines, (c) unshorn.

## **GRAZING OFF**

Throughout the 8 year period transfers of stock from Ashley Dene to the College have taken place. In 1941-42 and 1943 ewe hoggets were sent down from the end of September to November to graze off paddocks being saved for white clover seed and while the fat lamb grazing trials were in progress lambs from Ashley Dene were used to feed off the forage crops—rape, lupins, etc. These are recorded as “Stores” sold. For two winters store cattle from the College and dry cows from a neighbour’s dairy herd were grazed at Ashley Dene; these stock movements would practically balance if grazing charges were made. In 1944 the ewe hoggets were sent down to graze at the College farm until January, while in the same season lambs from the College were sent up for grazing at Ashley Dene. Analysis of these stock movements show that, from the “book-keeping” point of view, they may be disregarded as significantly affecting the overall picture.

## **DENTAL ATTRITION**

Prior to the establishment of a sub. clover turf the mouths of young sheep showed fairly rapid deterioration—the late Mr D. Sidey and Mr A. Leslie, who examined sheep from time to time, noted that rapid wearing of the incisors occurred. Dr. McMahon and the writer made a survey of over 500 ewes in 1941; they found that a high proportion of 6-ths and rising full mouth ewes showed unsoundness of mouth. However, it was considered that the change in the pasturage might relieve the position; this is largely the case, although there is still evidence that the younger sheep are not totally free from attrition. The condition is not so serious as to force a change from breeding and carrying 2-tooths to buying in 4-year-old ewes.

## **SHEEP MORTALITY**

Records of sheep numbers have been kept throughout the period, a monthly balance sheet being regularly written up. This record shows that ewe losses have been:—

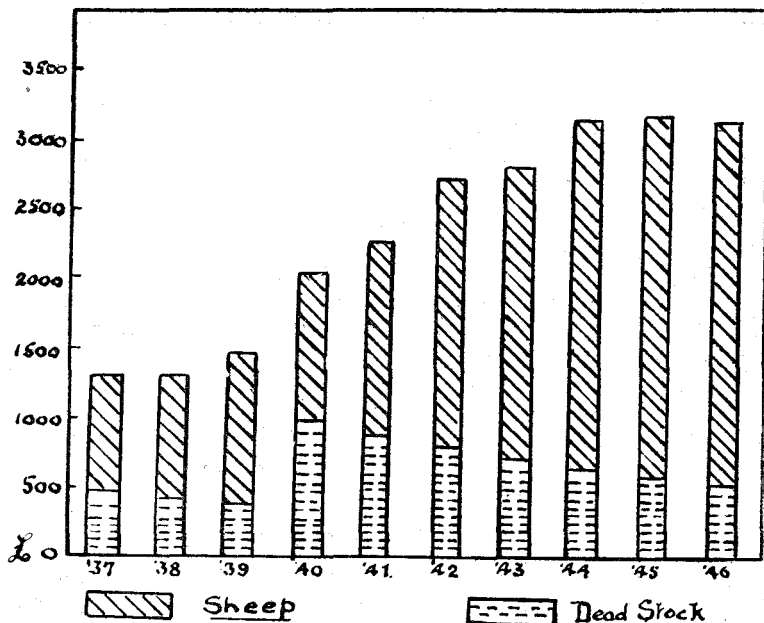


Year.	Ewe Flock.	Deaths.	% of Flock.	Ewe Hoggets.	Deaths.	% of Flock.
1937-38	865	24	2.8%			
1938-39	900	64	7.1%			
1939-40	1,140	49	4.3%			
1940-41	1,025	22	2.2%			
1941-42	1,170	40	3.5%	305	13	4.3%
1942-43	1,411	78	5.5%	286	14	5.0%
1943-44	1,417	78	5.6%	384	17	4.5%
1944-45	1,525	74	4.8%	422	15	3.5%
1945-46	1,652	55	3.4%	480	28	5.1%

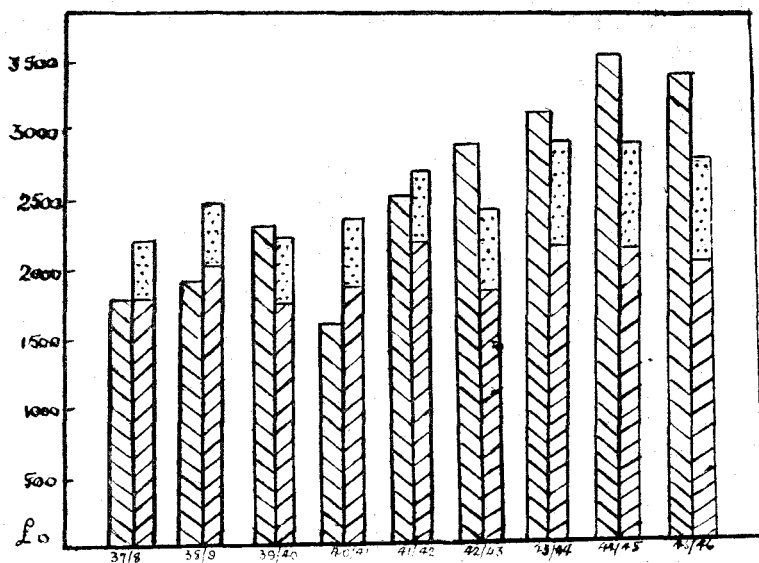
Average of 8 years: Ewes 4.3%. Of 5 yrs. Ewe Hoggets 4.6%

The monthly figures on deaths of ewes bring out with emphasis the vulnerability of the flock at and about lambing time: on the average 75% of the losses recorded above occurred in the July-September period.

It is well recognised that the most careful shepherding at lambing time is necessary if losses of ewes and lambs are to be avoided; it is questionable if we (in Canterbury) can afford to go to the expense and trouble which would produce the best results. Only with stud breeders is the mastery of the "art of handling lambing ewes" really seen at its best, but research into the economic value of more intensive care of ewes at lambing time by the employment of additional skilled labour may reveal that such management practice is well justified.



Graph showing increase in value of live and dead stock, 1937-46.



Graph illustrating annual trading account.

Receipts

Expenditure

Annual Interest on Land, Stock and Plant and "Overdraft"

## FINANCIAL CONSIDERATIONS

In this section a statement showing the annual Farm Trading Account is set out, together with the yearly balance sheets.

The working of the property has made it necessary for certain basal assumptions to be made in order to give the statements as close a resemblance as possible to those which would be compiled by a farmer working Ashley Dene along the lines followed over the period under review.

At the outset it is realised that such hypothetical working cannot present an exact picture, so that no attempt has been made to achieve spurious accuracy. The figures presented are in some cases actual, in others estimated. The basis of estimation is given below:—

1. **Labour:** The labour core of the farm is the Manager and the tractor driver. Students and cadets spend time on the farm for experience; they are regarded as providing the extra labour which might otherwise be employed and a charge is made for such labour. Contract labour is charged separately.

2. **Cultivation:** Costs and rates of work are based on records of operations in various paddocks over the years.

Ploughing	5 - 6 acres per day.
Grubbing	15 -20 acres per day.
Rolling	35 -40 acres per day.
Drilling	25 -30 acres per day.
Harrowing	40 -50 acres per day.
Mowing	2 acres per hour.
Raking (Horse)	2 acres per hour.

A typical case of working for turnips from grass is as follows:—

Area	30 acres.
Skim Ploughing	- 5 days.
Grubbing	- $2\frac{1}{2}$ days.
Harrowing	- $\frac{3}{4}$ day.
Rolling	- 1 day.
Deep Ploughing	- 5 days.
Harrowing	- 2 days.
Rolling	- 2 days.
Drilling	- $1\frac{1}{4}$ days.

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$19\frac{1}{2}$  days of 8 hours = 156 hours.

Rate of working 5 hours per acre (approximately).

Working from Rape to green feed Italian ryegrass and oats.

Ploughing	- 5 days.
Grubbing	- $1\frac{3}{4}$ days.
Harrowing	- 1 day.
Rolling	- 1 day.
Drilling	- $1\frac{1}{4}$ days.

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10 days of 8 hours = 80 hours.

Rate of working  $2\frac{1}{2}$  hours per acre.

Tractor costs, including repairs and maintenance, have been computed at 10/- per acre worked, or 3/- per hour for work other than cultivation and cropping.

3. **Hay and Silage Harvest Work:** Hay baling and silage stacking are carried out by student labour, with assistance from the farm labour. Hay baling is charged on "contract" at 6d. per bale and silage at 10/- per ton.

4. **Seeds and Manure:** Much of the ryegrass and white clover seed sown was seconds from the College, but, as no very accurate record of quantities has been kept, the seeds sown each year have been charged at current rates.

Charges for superphosphate and lime have been made at current rates, plus freight to the farm.

5. **Topdressing** is carried out by the College equipment and labour. This is charged at 3/- per acre over all.

6. **Stock Management:** There is no dip or shearing shed on the farm; sheep are shorn and dipped at the College by student labour. A charge of £5 per 100 sheep has been taken to cover all such costs. Rams are "hired" from the College at £2/10/- per head per annum.

7. **Sheep Sales and Purchases:** Figures for these items are those actually incurred in purchases and fat lamb sales. Cast-for-age ewes are normally killed at the College and these are valued at 15/- per head. Lambs transferred to the College for topping-off or experimental use are "sold" at 18/- per head.

8. **Wool:** Prior to 1942, the clip was bulked with the College wool and prices realised are so estimated. Since 1942 the actual value of the clip has been available.

9. **Interest and Depreciation** have been allowed on stock and plant at standard rates, while interest on Capital Value of property is charged throughout at 5%, and on "overdraft" at 6%.

The assumption is made that on 1st April, 1937, the property commenced operations with no mortgage, but with the intention of meeting all running costs together with interest on capital invested at 5% on the Government Valuation 1937. Up till this time and for some years the current expenditure and revenue balanced (approximately) but no surplus was available for interest. Had the property been worked as a commercial farm—adopting the same management—the mortgage commitments—amounting to, say, £200 per annum (5% on £4,000) might have been met if the owner had accepted low wages of management, curtailed expenditure on repairs and maintenance, allowed no depreciation, and so on. This has happened on many such farms in Canterbury but this policy of "living on capital" often results in run down and finally "sold up" properties.

The change in management of Ashley Dene over the eight year period—with all charges entered on the accounts—has required (on paper) the incurring of a deficit for the first four years, changing to a surplus for the next four.

In the first four years, the working expenditure has closely approximated the Revenue. The numbers and value of stock have steadily increased. For stock valuation the figures adopted were: £1 per ewe for the first five years, 22/- per head for the fifth and sixth years and 25/- per head for the last two years. The increase in value per head corresponds to the increase in young ewes and also to the improvement in uniformity and type throughout the flock. Ewe lambs are valued at 25/- per head throughout. These figures are purely arbitrary but they approximate the values of such sheep in Canterbury.

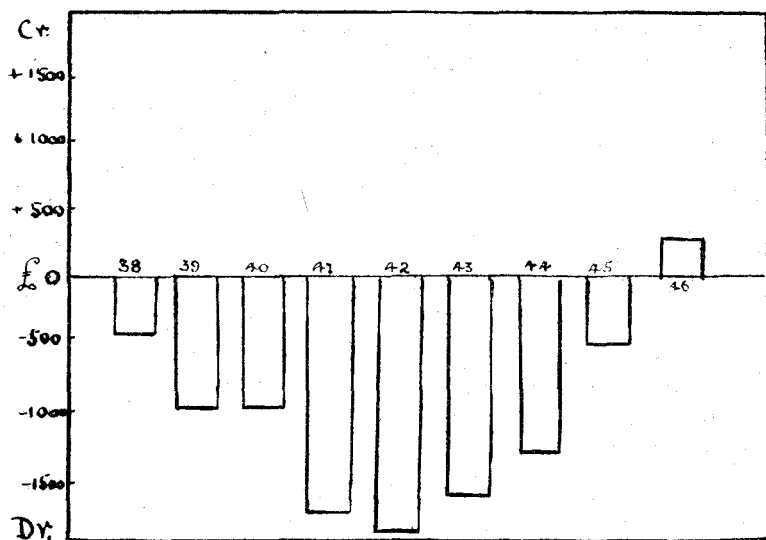
Alteration to the Capital Value of Land and Buildings occurs in 1943 when the manager's new house was erected. The value of implements increases in 1939, when tractor and tractor equipment were purchased and the horses sold.

The Capital account shows an increase in the value of Land, Buildings, Stock, and Plant from £8,500 to £11,600.

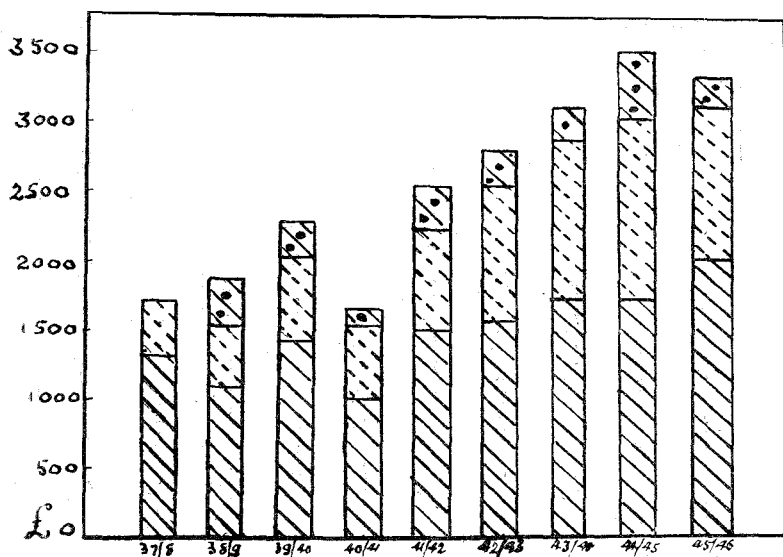
The Stock numbers increased from 860 4 and 5-year-old ewes to 1,650 2, 4, 6 and 8-tooth ewes with 400 ewe hoggets.

The production of wool rose from approximately 9 lbs. to approximately 24 lbs. per acre.

Despite the policy of breeding replacements, the number of lambs sold has risen from 930 to 1,360; or, if we take the average weight as 30lbs. per lamb, the production of meat has risen from 32lbs. to 51lbs. per acre.



Graph showing "overdraft" position at the beginning of each year.



Analysis of Yearly Revenue.

Stock sold



Wool sold



Crops sold

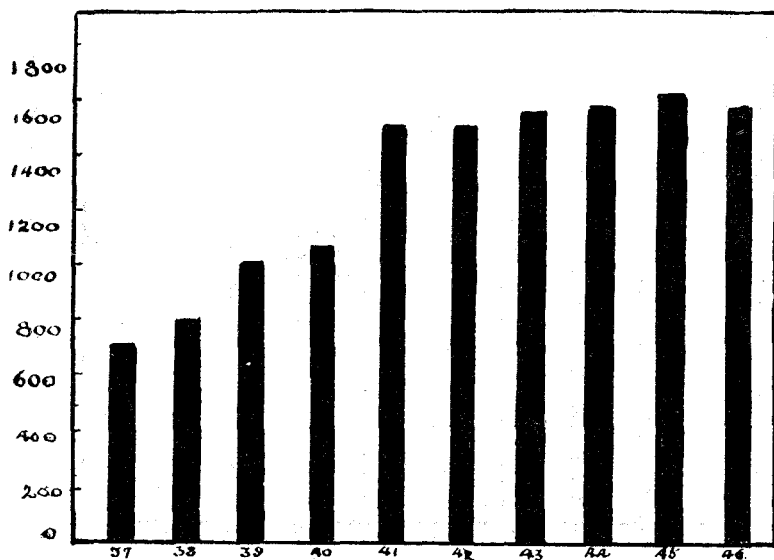


### Optimum Stock Numbers: Future Possibilities

Study of the increase of area in good pasture over the period of eight years shows that, **given a guaranteed adequate supply of winter feed**, the carrying capacity of the subterranean clover on the light land from September to weaning is approximately  $2\frac{1}{2}$  ewes per acre.

In the graph charting the number of stock carried and the estimated feed available, the following basis of calculation was made:—

Rye-White pasture on homestead block	5 ewes per acre.
Good Sub. clover on other blocks	3 ewes per acre.
Fair Sub. clover on other blocks	$1\frac{1}{2}$ ewes per acre.
Poor pasture	1 ewe per acre.



Estimated carrying capacity of pastures for spring and early summer.

By 1st April, 1946, all the older clover paddocks were classed as "good," there being only the one-year-old sward (No. 17) which had yet to thicken. Both this paddock and 17A may be some years in reaching the "good" stage, particularly on their west side, where the soil is very thin.

However, if it be assumed that 150 acres be under cultivation annually and that this be on the Cemetery and Main blocks, there will then be approximately 600 acres of sub. clover pasture. If we adopt the  $2\frac{1}{2}$  ewe figure the number carried would be 1,500 ewes. There still remain the 100 acres on the Homestead block, half of which may be devoted to growing lucerne. The remaining 50 acres of good rye-white clover pasture at 4 ewes per acre could carry further 200 ewes, giving a total of 1,700 ewes.

If replacements are bred, and we assume an equivalent grazing requirement of two hoggets to one ewe, then 1,500 ewes and 400 ewe hoggets can be, and in actuality have been, carried.

However, if areas are to be closed up for production of ryegrass or clover seed, or if crops are being grown, the number of ewes carried must be reduced accordingly. This may be done either by culling more heavily in Autumn, or by carrying the normal number through the winter and selling cast-for-age ewes with lambs in September. The certainty and adequacy of the winter feed supply must determine the line of action taken.



Effect of undercurrent. Pad. 8.



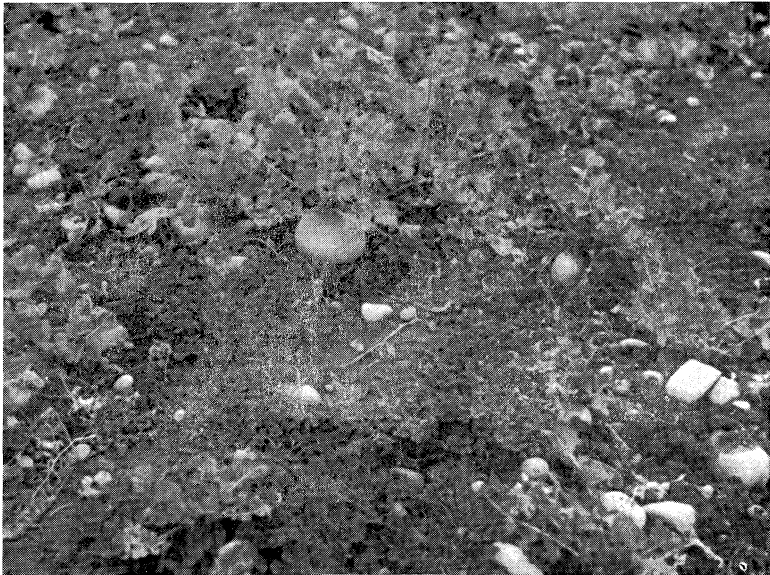
Undercurrent on lucerne. Pad. 6. Harvesting difficult and lucerne replaced by Yorkshire fog.





Seven-ton roller at work. Pad. 11.

This implement was built at the College in 1946 and is doing good work, rolling in surface stones and consolidating the light land.



Regeneration of Sub. Clover in Turnip crop, 1946. Pad. 20A.

Following on the feeding off of turnips the sub clover developed into an excellent spring pasture.

The experience of the eight years indicates that on the light land good sub. clover pasture, annually top dressed, will carry about  $2\frac{1}{2}$  ewes per acre, provided the winter feed supply is adequate. The carrying capacity on the Homestead block and the western end of the Cemetery block would be somewhat higher. In the past season, 1945-46, the carrying capacity of Ashley Dene exceeded this figure, but the following stocking and land utilisation might be conservatively adopted.

During the period under review, there has been no devastation or wholesale destruction of pastures by drought, or grass grub; each has caused some minor feed shortages occasionally, but it has not been necessary to reduce stock numbers drastically. It must be realised, however, that through these causes such reduction may be imperative in some seasons so that hypothetical stocking of 1400 ewes and 400 ewe hoggets may be regarded as the average number of sheep carried over future years now that the whole farm is developed. Whether the number is on the conservative side or not is a matter of opinion, but it will serve to indicate what the future management of the farm may yield. In the preparation of the following "budget," no inclusion has been made of such fortuitous revenue as might result from the sale of harvested crops, though it should be appreciated that on country of this type no opportunity should be lost to "cash in" on any such crop should favourable conditions make it possible.

### **Cropping and Cultivation:**

Forty acres ploughed out of grass annually.

Crop sequence: Turnips and lupins, Rape, Greenfeed, New grass on fallow.

Forty-five acres lucerne producing 100-120 tons of hay per annum.

Six hundred and fifty acres good pasture receiving the equivalent of  $\frac{1}{2}$  cwt. Super and 3 cwt. of Lime each year.

(No allowance is made for harvested crops which may or may not be taken according to seasonal conditions.)

### **Stock:**

1400 ewes, 400 ewe hoggets.

Ewes sold at five years.

Lambing percentage average 105%, death rate 4%.

Wool clip 10/- per sheep shorn.

Statement showing approximate expenditure and revenue for the above "set up" at current prices and costs:—

Expenditure:		Revenue:	
	£		£
Wages . . . . .	700	Sale of Lambs . . . . .	1,150
Tractor Costs . . . . .	100	Sale of Surplus Ewes	
Lime and Super. (Crops) . . . . .	85	including 2-tooths . . . . .	230
Seeds . . . . .	100	Wool . . . . .	850
Topdressing includ. Lime and Super. . . . .	300		<hr/>
General . . . . .	50	Surplus available for paying interest £470.	£2,230
Chaff . . . . .	15		
Shearing . . . . .	90		
Hire of Rams . . . . .	90		
Repairs and Maintenance . . . . .	85		
Depreciation . . . . .	100		
Rates . . . . .	30		
Insurance . . . . .	15		
	<hr/>		
	£1,760		

The above statement shows that, from now on, provided prices hold at present levels, the farm may be expected to provide a surplus of approximately £450 to £500 per annum, where, before development began, any surplus was rarely achieved once running expenses were met. This is a satisfactory state of affairs, but what is even more satisfactory is the fact that this same area of land is now producing so much more wool and meat than formally, while at the same time the fertility of the land has been considerably raised. Further, as far as can be seen at the moment, there is no reason to doubt that the existing conditions can be maintained indefinitely.

### Discussion on Eight Years' Work:

The point has been made that this survey is the study of land utilisation on a particular farm. How far the practices followed may be applied to other farms is matter for discussion.

To summarise the whole undertaking the following facts are of prime importance:—

1. Ashley Dene farm is not all "light" land—there is an area (approximately 10%) which is of heavier land and therefore not subject to drought as is the remaining area.
2. This heavier land has served two useful purposes:—
  - (a) It has provided from an area of 46 acres the lucerne hay and silage for wintering stock.
  - (b) It has yielded, on a limited scale, ancilliary crops of small seeds, wheat, and linseed which have augmented the revenue from sheep.

3. The whole structure of the farm management programme rests on:—

- (a) Guaranteed supply of Winter forage from lucerne.
- (b) Reduced areas of turnips, greenfeed and rape.
- (c) Permanent pastures—dominantly sub. clover.
- (d) Adequate dressings of lime and super. to maintain those pastures.
- (e) The absence of the “forced” necessity to plough up pastures, even though they may be temporarily destroyed by drought or grass grub attack.
- (f) The reduction—as a result of (e)—of the area under cultivation each year.
- (g) The replacement of horses by a tractor, which further reduces the need for cultivation, as oats are not required.
- (h) The increase in the number of stock carried, so that the production per acre is increased and the cost of production per unit reduced.

4. The management of the sheep has been changed from that of “buying in” (half bred flock) to one of breeding replacements for a Romney threequarter bred flock. The soundness or otherwise of this policy may be the subject of contention. At the moment it appears to be satisfactory, particularly as sheep of the desired type are scarce in Canterbury. Lambing has been advanced from September to August, as many lambs as are killable being drafted off the ewes in December and January.

5. Pasture management is fairly simple.

- (a) Newly established pastures are sown on fallow to ensure success.
- (b) During the first Spring and Summer these new pastures are grazed lightly—if at all—to allow free seeding of clover.
- (c) Certain pastures—approximately 100 acres—are closed up in April-May to provide early feed for lambing ewes, in conjunction with the greenfeed Italian ryegrass.

Only in the last three years or so has topdressing reached the systematic stage, giving as far as possible the equivalent of 1 cwt. of super or 5-10 cwt. of lime per acre

in alternative years, or, to put it another way,  $\frac{1}{2}$  cwt. super with  $2\frac{1}{2}$ -5 cwt. of lime, annually.

The application of the methods employed to extensive areas of light land in Canterbury is worth serious consideration. Establishment of sub. clover pastures by a **"policy of gradualness"** should be attempted. On all farms, pasture re-establishment is necessary where Winter and Summer forage crops, and oats for chaff are grown. The addition of sub. clover to the mixtures normally sown should be standard practice; if the price of seed seems to present an obstacle, it will pay to reduce to a minimum other species sown, to provide for the 2 or 3 lbs., of sub. clover—remembering that time of sowing and care in sowing are all important. This requires no extra outlay in the farm expenditure.

It is with the additional expenditure on lime and super that the establishment of sub. clover pastures departs from the normal cost of running light land farms; but **provided this initial expenditure can be met until the subsequent increase in stocking with its resultant higher returns per acre is achieved**, the venture will prove well worth while.

It should be realised that for the first few years expenditure is increased—by the cost of topdressing—while revenue from stock is decreased as ewes or ewe lambs retained to increase the flock become "capital" stock and so are not sold for "current revenue."

As stock numbers increase, the need for a guaranteed feed supply becomes more imperative. Three main hazards must be anticipated:—

1. **Drought:** A prolonged dry spell in late summer and autumn has three main effects.

Firstly, forage crops—rape for lamb fattening, turnips and lupins for wintering and green feed for lambing ewes—may be wholly or partially destroyed.

Secondly the autumn growth of pasture is delayed; this results in reduced winter grazing and also in a much less vigorous flush of feed in the spring.

Thirdly, if the dry weather sets in early, the clover pasture may dry off before the lambs are fit to draft or wean, the ewes' milk supply is seriously affected, and instead of fat lambs, store lambs are sold.

2. **Grass Grub and Porina**, which may vary in the nature and intensity of their attack, but which may in some years completely destroy the herbage over a large area of any property.

3. **Internal Parasites and Footrot**, which in years of flush growth may seriously affect the flock and which should be tackled with determination in their early stages.

At Ashley Dene the effect of these three hazards has been offset to some degree.

#### **Lucerne:**

Lucerne on the heavier land has guaranteed supply of hay and silage. We have not yet explored the possibilities of lucerne on the light land—it may be possible to establish satisfactory stands which, while yielding less, may be none the less permanent, provided they are reserved for hay only. On many farms, oaten chaff may still continue to be the main standby for winter dry feed. The grazing of lucerne in drought years has proved satisfactory for finishing lambs but the grazing definitely shortens the life of the stand. This crop is resistant to grub attack once the plants are well established and the trials in progress with the “creeping lucerne” (*Medicago glutinosa*), may show that this plant has a place in pastures as a grub resistant legume.

#### **Grass Grub:**

Though sub. clover is eaten out by grass grub and porina, its reseeding capacity is such that it recovers in subsequent years without being resown. Cocksfoot shows a higher degree of resistance than does ryegrass, which, on the lighter land, rarely survives grub or severe drought. It is not yet proved, however, that cocksfoot will survive indefinitely under heavy sheep grazing. Trials with *Phalaris tuberosa* as a grub and drought resistance species are proceeding—this plant gives promise of possessing qualities which may earn it a place on our light land pastures. As experience has shown that the life of ryegrass, white clover and red clover is definitely limited on this type of land, the expenditure on mixtures containing these species should be closely controlled. Where it is possible to take a crop of ryegrass seed in the first year, the question of the price to be paid for the seed sown requires special attention. If seed saving is uncertain and infrequent, cheap seed is preferable, for the life of the ryegrass and clover plants (other than sub. clover) may be very short indeed.

#### **Parasites and Footrot:**

Parasites in lambs are controlled by drenching, using a drench of the phenothiazene type. Normally one drench at weaning is sufficient; in wet summers this may be repeated. Footrot is not normally severe, but a footrot bath

has been built and is brought into use whenever any sign of scald or footrot appears in the flock. Dressing of the feet and isolation of affected sheep tend to limit the spread of the trouble.

Much discussion has arisen as to what area of light land may be considered an economic holding. There is, despite its apparent sameness, considerable variation in light land soils, they are often "strippy" with bands of deeper silt loam or sand running across the shingle. Where these occur, lucerne and more highly productive pastures may be established; with the former, the permanence of the stand may reduce the area required for cultivation. While no definite figure is as yet available, it seems that an area carrying 1,000 ewes might be regarded as an initial unit, capable of development to carry, at length, 2,000 ewes or their equivalent. When development of light land is being undertaken, the purchase price of the area should be such that the margin between that price and the potential developed value may be taken to represent the extra capital outlay which will be required to complete the development process. If most of this expenditure can be provided from revenue, the individual farmer will feel his position to be more sound as the work proceeds.

The Ashley Dene development scheme has shown that the production of our lighter plains land can be increased; that its service in providing more meat and wool may be enhanced. This, after all, is one of the main purposes behind our farming activity. There are many thousands of acres of the Canterbury Plains capable of being developed along lines similar to those described in this survey, but the work must be tackled with an appreciation of the economic and farming hazards involved and with the exercise of due care in limiting their effect.

### ACKNOWLEDGMENTS

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Mr G. McEwan, the College accountant, who prepared the various financial statements.

Mr R. Blackmore for much of the photography.

# “BANK ACCOUNT” 1937-1946

## RECEIPTS

## PAYMENTS

	Balance brought down	Receipts	Balance carried down	TOTAL		Balance brought down	Pay- ments	Interest on Capital	Interest on Overdraft	Balance carried down	TOTAL
	£	£	£	£		£	£	£	£	£	£
1937/38		1740	415	2155	1937/38		1730	425			2155
1938/39		1900	980	2880	1938/39	415	2015	425	25		2880
1939/40		2270	978	3248	1939/40	980	1750	459	59		3248
1940/41		1610	1741	3351	1940/41	978	1855	459	59		3351
1941/42		2505	1990	4495	1941/42	1741	2190	459	105		4495
1942/43		2830	1549	4379	1942/43	1990	1810	459	120		4379
1943/44		3080	1266	4346	1943/44	1549	2180	524	93		4346
1944/45		3500	471	3971	1944/45	1266	2105	524	76		3971
1945/46		3345		3345	1945/46	471	1990	524	29	331	3345
1946/47	331										



# ANNUAL "BALANCE SHEETS" ASHLEY DENE 1937-1946

	31 March 1937	31 March 1938	31 March 1939	31 March 1940	31 March 1941	31 March 1942	31 March 1943	31 March 1944	31 March 1945	31 March 1946
<b>ASSETS</b>										
	£	£	£	£	£	£	£	£	£	£
Land & Buildings	7200	7175	7150	7130	7110	7090	7070	8315	8265	8220
Implements	320	297	277	950	860	785	715	650	590	535
Horses	120	108	98							
Sheep	865	900	1100	1000	1400	1950	2050	2550	2650	2600
Deficit		440	860	1078	1551	1345	894	231		
Cash at Bank										331
	8505	8920	9485	10158	10921	11170	10729	11746	11505	11686
<b>LIABILITIES</b>										
Capital	8505	8505	8505	9180	9180	9180	9180	10480	10480	10480
Bank Overdraft		415	980	978	1741	1990	1549	1266	471	
Surplus									554	1206
	8505	8920	9485	10158	10921	11170	10729	11746	11505	11686

## NOTES:

### 1. 1940. NEW CAPITAL—

Tractor, etc.	795	0	0
Less Sales Horses & Implements	120	0	0
Net Addition	£675	0	0

### 2. 1944. NEW CAPITAL

House	£1300	0	0
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ASHLEY DENE FARM TRADING ACCOUNT

	37/38	38/39	39/40	40/41	41/42	42/43	43/44	44/45	45/46		37/38	38/39	39/40	40/41	41/42	42/43	43/44	44/45	45/46
	£	£	£	£	£	£	£	£	£		£	£	£	£	£	£	£	£	£
Stock at 1 April	865	900	1100	1000	1400	1950	2050	2550	2650	Sales—									
Wages	425	470	470	550	580	630	630	700	700	Lambs	1000	1000	1200	880	1270	1340	1225	1350	1700
<b>Cropping and cultivation</b>										Ewes	300	120	210	80	190	230	470	360	360
Blacksmith—										Wool	440	470	580	530	725	990	1160	1280	1090
Tractor Exes.	30	30	85	75	100	95	100	100	120	Wheat		130					190		
Lime & Super	160	260	280	190	385	335	195	230	280	Oats			100						
Seeds	210	165	135	195	200	135	155	165	205	Hay & chaff				120					
Topdressing	70	50	55	35	75	60	40	50	35	Barley					65				
Harvesting	20	70	110	85	145	80	110	145	135	Grass seed		180					35	40	25
Chaffcutting	20	25								White Clover			180		90			470	170
General Charges	40	50	40	30	45	30	40	40	35	Lupins					165				
Chaff Purchases								15	15	Linen flax						270			
<b>Sheep—</b>																			
Shearing, etc	40	45	55	50	70	85	90	100	105	Stock 31 March	900	1100	1000	1400	1950	2050	2550	2650	2600
Purchases	570	700	340	470	410	160	600	330	130	Balance c/d.	15								
Hire of Rams	50	55	75	70	75	90	90	100	100										
Repairs & Mtce.	55	55	65	65	65	65	85	85	85										
Depreciation	60	55	120	110	95	90	120	110	100										
Rates	30	30	30	30	30	30	30	30	30										
Insurance	10	10	10	10	10	15	15	15	15										
Balance c/d.		30	300	45	770	1030	1280	1385	1205										
	2655	3000	3270	3010	4455	4880	5630	6150	5945		2655	3000	3270	3010	4455	4880	5630	6150	5945
Balance b/d.	15																		
Interest—										Balance b/d		30	300	45	770	1030	1280	1385	1205
5% on capital	425	425	459	459	459	459	524	524	524	Deficit	440	420	218	473					
6% on o/draft		25	59	59	105	120	93	76	29										
Surplus					206	451	663	785	652										
	440	450	518	518	770	1030	1280	1385	1205		440	450	518	518	770	1030	1280	1385	1205

