

CANTERBURY AGRICULTURAL COLLEGE.

THE APPLICATION OF GRASSLAND INFORMATION
TO CANTERBURY FARMING PRACTICE AT PRESENT PRICE LEVELS,

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The object of this paper is to show on a financial basis the relation between poor pastures, good pastures, and mixed farming (including good pastures).

Valuable information has accumulated during the last few years concerning strains of grasses, pasture establishment, grazing management, topdressing, harrowing, feed conservation, winter maintenance of stock, and distribution of feed supply. The importance of each of these as links in the chain of economic production is acknowledged. Their correct use and co-ordination with cash cropping is essential in securing maximum net returns.

To illustrate this point, the following details of costs and returns from many farms have been adjusted to a 400 acre basis. Details of three farms on medium to good land are given. Changes in the management are suggested by which the returns from any one of these would, in the course of time, be equal to those of any other. The present state of these farms is as follows :--

- (1) Poor strains of grass: a team fully occupied in providing sheep feed: few sheep: minimum expenditure: low returns -- earning £12 per annum for interest.
- (2) Good grass: team as before: maximum number of sheep: greater expenses chiefly in topdressing: greater return -- earning £163 for interest.
- (3) Good grass and cropping: team costs divided between crops and sheep: moderate number of sheep: more labour employed: increased running expenses: greater returns -- earning £326 for interest.

Details of areas sown, expenditure and income are set out in Appendix 1.

On farm No.1 owing to non-permanent strains of grass, paddocks have to be ploughed up because the temporary strains die out and leave them unproductive. Green crops are sown, firstly because they provide feed when it is wanted and secondly because they are a means of getting the land back in grass. Feed from them is so abundant in January, February, March and April as to warrant the buying of store lambs. From April to August sufficient feed is obtained from turnips and greenfeed, and up till November from grass. During December the temporary strains, along with hairgrass, trefoil etc., fail to produce enough feed to keep lambs thriving. It is this late spring and early summer deficiency that necessitates the growing of fattening crops. These appear so profitable that farmers are encouraged to grow them year after year. Temporary strains of grass however, make large areas of fattening crops essential, so that the area devoted to grass is reduced and ewe numbers kept low.

On farm No. 2 the use of permanent grass makes it unnecessary to break up large areas annually, and supplementary crops are reduced by 100 acres, The team appears to be used less

efficiently, yet in spite of this, the farm is more efficient than No.1. The advantage of the former lies in its better grass which, with topdressing, provides sufficient feed to fatten over half of the lambs on the mothers. Less rape is required. Hay saved from a small area of lucerne ensures the winter feed position. Lambs are fattened on new grass, green lucerne, rape and turnips along with some lucerne hay. There is no trading in store lambs.

On farm No.3 the feed position is the same as that on No.2. Labour costs are higher and more cultivation is done than on No.2, but less than on No.1. Total working expenses are greater than in either of the other two. Judging by the area cultivated the team is most efficiently used on farm No.1, but taking the farm as a unit farms No. 2 and No. 3 are the more profitable. The growing and harvesting of cash crops increase the working costs, but both the income and net returns are greater. For these reasons, team efficiency cannot be measured by area cultivated alone.

An increase of 50% in the value of farm produce would improve the financial position or net returns of No. 1 by about £200, that of No.2 by about £350, and that of No.3 by about £500. The figures in the Appendix make it clear that under Canterbury conditions grassland farming must be associated with mixed farming in order to get the best returns. These figures also show that regardless of the general price level the combination of good grass and crops is the best practice.

Stock and station agencies must now have accumulated much information about estimated costs and returns on properties in which they are interested.- This must be invaluable to them, but if it were edited and published by someone who, after visiting the farms concerned, could make a careful analysis, it should have considerable educational value to the farming community. Investigations of such material along the lines indicated above, appear to be of more importance at the present time than any other separate piece of grassland research.

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A P P E N D I X 1.

In the following pages outlines of the general management, cropping, and stocking, with the details of expenditure and income are given for three separate farms of 400 acres of medium to good land.

(1) TYPICAL PRESENT POSITION, -- FARM No. 1.

A farm of this class carrying entirely sheep and depending solely upon sheep products for income may have some good pastures, but generally a 5 or 6 horse team is kept going the greater part of the year cultivating the land for supplementary crops and temporary pastures. The fields are ploughed up for these crops not because the crops are essential, but because the grass has run out. These run out fields give a very low production. In many instances, of course, the ploughing and resowing cannot keep up with the number of fields that require breaking up with the result that weeds, hairgrass, browntop, and sweet vernal, soon invade.

Usually in the rotation oats for chaff follows old grass and is followed by greenfeed oats which may be followed by turnips and grass, or kale and grass. Rape and grass are also grown and provide the bulk of lamb fattening feed. Oats are grown for the team, some may be threshed and some fed to the sheep in winter, but usually there is not a saleable surplus. On a 406 acre farm at least 50 acres and perhaps 75 acres are sown to grass ^{each year} with some crop such as turnips, rape, kale, or over oats.

The details may be given as follows:-

(1) Area 400 acres. --- sheep farm --- feed provided by poor grass and supplementary feeds.

(2) <u>Crops.</u>	<u>Crop.</u>	<u>Acres.</u>	<u>Sown After.</u>	<u>Yield</u>	<u>Feed</u>
				<u>per ac.</u>	<u>Provided.</u>
	Oats.	40	Old grass.	1½ tons.	--
Greenfeed	Oats.	50	Old grass	10ac.	Oats -- --
			40ac.		
Turnips.		25	Greenfeed	Oats.	-- --
"	& Grass.	25	"	"	-- --
Rape	& Grass.	25	Turnips.		Fatten 18
Kale	& Grass.	25	Old Grass.		lambs per
					acre.
		<u>Total</u>	<u>100 ac.</u>		

(3) Grass Seed Mixture. --- sown with above crops.

	Per acre,	
Temporary per. rye.	20 lb.	--- stripped on farm
Cocksfoot.	3 lb.	--- bought,
Rod Clover,	4 lb.	--- bought.

TOTAL 27 lb.

open turf of Grass which runs out in $1\frac{1}{2}$ to 2 years.

(4) Stock.

Horses.	---	6 horse team and 1 spring carter.
Cattle.	---	2 cows and one or two young stock.
Pigs.	---	Nil.
Sheep.	---	600 breeding ewes.
		13 rams.
		<u>10</u> killers.

TOTAL 623.

93% lambs sold fat --- one truck. (78) fat off mothers, and others fattened on above feeds, Death rate in ewes 4%.
Ewes used as killers. and 250 sold fat. 300 ewes bought each year. 200 rape lambs bought in March.

(5) Top-Dressing. --- Nil.

(6) Manure. All crops sown with 1cwt. super per acre, but no lime sown with turnips.

(7) Seeds, Oat seed threshed and rye seed stripped for home use, Other seeds bought.

(8) Lucerne. --- Nil.

(9) Winterfeed. Sheep wintered on turnips, turnips and grass, greenfeed oats.

FINANCIAL STATEMENT.

<u>EXPENDITURE.</u>		<u>INCOME.</u>	
Wages: Owner	130	Fat Lambs 558 at 12/6	348
boy	26	Wool 600 fleeces at 3/6	105
harvest	8	Fat ewes 250 at 6/-	75
Insurance	6		
Rates	25		
Land Tax	23		
Shearing	7		
Crutching	3		
Dipping	10	Cows. Butterfat (1cow)	7
Woolpacks, Branding Oil	3	Chaff 10 tons at £2/10/-	25
Seeds	29		
Manure 10 tons at 4½	45	Rape lambs 195 at 12/6	122
Cartage: Wool	4		
Manure	3		
Other	5		
Chaff Cutting 50 tons 9/-	23		
Threshing	4		
Repairs	10		
Blacksmith	15		
Twine	6		
Sacks	-		
Horse Maintenance	6		
Pence Maintenance	5		
Sheep Bought 300 ewes			
at 10/-	150		
3 Rams at £3	9		
200 Rape Lambs			
at 9/6	95		
Sundries	20		
	<u>670</u>		
		<u>TOTAL</u>	<u>682</u>

DIFFERENCE £12-0-0.Seed Details:

	lb.		
Cocksfoot	225	at 9'	8½
Red Clover	300	at 9'	11
Turnips	35	at 2/-	3½
Rape	75	at 9'	3
Kale	75	at 9'	3
			<u>29</u>

- NOTE: (1) No interest allowed on **live** and dead stock and working capital.
- (2) Owner **allowed** £130, but many of these farmers are living on £90 and \$100 **allowances** when in financial difficulties.

FARM No. 2 -- GOOD GRASS.

Permanent strains of grass are properly managed and topdressed. It is established by sowing it by itself on a well prepared seed bed. **Cropping** area is reduced. Sixty per cent of lambs are fattened on the mothers. Lucerne provides hay in

(4)

winter and some lamb feed in late summer. The following are the main points in the management of this farm :--

(1) 400 acres - sheep farm, feed provided chiefly by top-dressed permanent pastures.

(2) Crops: Lucerne 20 acres, cut twice (30 tons hay) then grazed and fattens 4 Lambs per acre.

Oats 30 acres, sown after rape and turnips, yields $1\frac{1}{2}$ tons chaff per acre,

Rape 15 acres and early turnips 15 acres, sown after old grass, winter ploughed, fattens 20 lambs per acre.

New grass 30 acres, sown in November, winter fallowed after oats, fattens 4 lambs per acre in autumn and provides greenfeed for lambing ewes in spring.

Total 110 acres.

Rotation : Old grass :- rape and turnips :- oats :-
new grass.

(3) Grass seed mixture: One third area sown in dominant cocksfoot.

Two thirds area sown in dominant ryegrass.

DOMINANT RYEGRASS.

DOMINANT COCKSFOOT.

Amount per acre.

Amount per acre.

True Perennial ryegrass	30-35 lb.
Cocksfoot (75% germ)	5-7 "
Red clover	4 "
White clover	1, " "
<u>Total</u>	<u>40-47 lb.</u>

5-8 lb.
15-20 "
4 "
1, " "
<u>125-33 .</u>

(4) Stock: Horses 4 horse team and 1 spring carter.

Cattle 2 • GWS and 1 or 2 young stock.

Pigs nil,

Sheep 1,000 breeding ewes
24 rams
10 killers

100% lambs sold fat -- 600 fattened on mothers, others fattened on rape, turnips, lucerne, new grass. Xwes used for killers, death rate $3\frac{1}{2}\%$, and 440 ewes sold fat. 500 ewes bought.

(5)

(5) Topdressing : Permanent grass receives 1½ cwt. Super per acre annually in August and 5 cwt. Lime every 3 to 4 years. No manure applied for two' years before ploughing up old grass. Lucerne receives 2 cwt. Super per acre annually applied in September (1 cwt.) and December (1 cwt.) and 5 cwt. Lime annually.

(6) Manures Same as farm No, 1, but lime sown with turnips and- rape

(7) Seeds : Rape and turnip, cocksfoot and red clover seed purchased, Oat seed threshed and ryegrass *cut* and threshed for home use,

(8) Lucerne : Renewed every 10 years -- annual amount of seed **30** lb.

(9) Winter feed : Sheep wintered on lucerne hay, 'oatsheaf chaff' and topdressed grass. (**30** ton lucerne hay, and 20 ton oatsheaf chaff).

FINANCIAL STATEMENT.GOOD PERMANENT GRASS - AREA 400 ACRES.

<u>Expenditure.</u>			<u>Income.</u>	
Wages: owner	130		Fat lambs: 1,000 at 12/6	625
boy	26		Wool: 1,000 at 3/6	175
harvest	<u>12</u>	168	Fat ewes: 440 at 6/-	132
Insurance	6		Cows: butterfat from one	7
Rates	25			
Land tax	<u>23</u>	54		
Shearing	12			
Crutching	5			
Dipping	14			
Wool packs & branding				
oil	5	36		
Seeds (see details)	<u>20</u>	20		
Manure (see details)	104			
Lime	<u>14</u>	118		
Cartage, manure, lime, wool etc.	<u>25</u>	25		
Chaffcutting	21			
Threshing	<u>4</u>	25		
Repairs	10			
Blacksmith	10			
Twine	5			
Loss on sacks	--			
Horse maintenance	4			
Fence "	<u>8</u>	37		
Sheep bought:				
500 ewes at 10/-	250			
6 rams at £3	<u>18</u>	268		
Sundries	<u>25</u>	25		
		<u>£ 776</u>		<u>£ 939</u>

DIFFERENCE £163.

Seed Details:

Cocksfoot, 270 lb. @ 9d.	10½
Red clover, 120 " @ 9d.	4½
Rape, 45 lb. @ 9d.	1½
Turnip, 12 lb. @ 2/-	1½
Lucerne, 30 lb. @ 1/6	<u>20</u>

Manure Details:

	Super	Lime.
crops, including new	4½ t.	1½ t.
grass,	2	5
Lucerne	16	16
Grass	<u>22½</u>	<u>22½</u>

Say 23 tons super and 23 tons lime.

FARM No.3 - GOOD GRASS AND MIXED FARMING.

On a farm of this type a high standard of managerial ability would be necessary on the part of the owner. Crops, stock, and sidelines are fitted in well. If the main points of the management are tabulated they will be :--

(1) 400 acres - mixed and sheep and sidelines.

(2) Crops :

<u>Crop.</u>	<u>Area.</u>	<u>Yield.</u>
Lucerne (two cuts)	20 ac.	30 tons hay,
Wheat	30 ac.	35 bus.p.ac.
Oats	30 "	1½ tons p.ac.
Certified ryegrass seed	30 "	30 bus.p.ac.
Cocksfoot seed	10 "	300 lb. " "
Red clover seed	10 "	100 " " "
Potatoes)	5 "	4 tons table
Mangels)	2 "	25 " " ac.
Rape)	10 "	fatten 18 lambs
Early turnips)	13 "	
New grass (sown November)	20 "	fatten 4 lambs
		p.ac.
	<u>Total 180 "</u>	

Rotation. Red clover } Potatoes }
 Old grass } Mangels } -wheat-wheat-oats--
 Rape }
 Turnips }

-red clover (for crop)
 New grass (oat stubble
 fallowed through
 winter)

(3) Grass seed mixture. (same as No. 2, except that only dominant ryegrass sown) .

(4) Stock. Horses-5 horse team and 1 spring carter.
 Cattle-breeding cows and 2 heifers.
 Pigs --
 Poultry 3 100 birds.
 Sheep-- 740 breeding ewes
 16 rams
 10 killers
766 total sheep.

Sheep -- 100% lambs fattened - 60% fat off mothers, and others fattened on rape, turnips, lucerne now grass.
 Ewes used for killers, death rate 4% and 320 ewes fattened. 370 ewes bought each year.

(5) Topdressing .same as MO. 2.

(6) Manure - same as farm No.1, but lime used with turnips and rape.

(7) Seeds - Only turnips, rape, mangels, lucerne seeds purchased (see details). Others home grown.

(8) Lucerne renewed every 10 years as in X0.2.

(9) Winter feed. - Sheep and cows wintered on ryegrass and oat straw, lucerne hay, and chaff (if needed). Pigs fed and fattened on wheat, mangels, turnips, potatoes, and meat meal (bought). Poultry fed on lucerne, meat meal (bought), and wheat.

FINANCIAL STATEMENT - FARM No. 3.

<u>Expenditure.</u>			<u>Income.</u>	
Wages: owner	150		Fat lambs: 740 @ 12/6	462.
boy	26		Wool: 740 fleeces @ 3/6	129.
man	52		Fat ewes: 320 @ 6/-	96
harvest	10	238		
Insurance	15		Cows: 3, butterfat	21
Rates	25		Pigs: progeny 3 sows,	
Land tax	23	63	½ sold as weaners 20 @ 10/-	
Shearing	9		½ II " pbrkers 20 @ £1	30
Crutching	4		Poultry: 100 birds each	
Dipping	12		12 doz. eggs @ 10d.	50
Wool packs, branding	4	29		
Seeds	5	5	Wheat: 30 acs. @ 35 bus. less	
Manure and lime	115	115	seed, 2nds, fowl feed,	
Cartage	43	43	700 bus at 3/-	105
Chaffcutting	20		Chaff: 15 tons @ £2:10:0	37
Threshing	51	71	Ryegrass seed: 30 acs. @ 30	
Repairs	20		bus. less seed, 850 bus.	
Blacksmith	10		at 3/-	127
Twine	15		Cocksfoot seed: 10 acs. @	
Loss on sacks'	6		300 lb. less seed 2800 lb.	
Horse maintenance	6		at 4d.	46
Fence "	10	67	Red clover: 10 acs. @ 100 lb.	
Sheep bought:			less seed, 880 lb. @ 8d.	29
370 ewes @ 10/-	185		Potatoes: 5 acs. @ 4 tons	
5 rams @ £3	15	200	table, 20 tons at £2:10:0	
Sundries	30		5 tons seed 3 @ 3:0:0	5
Fowl feed	10	40		
		<u>£ 871</u>		<u>£1.197</u>

DIFFERENCE £326.

Seed Details:

Turnip, 10 lb. @ 2/- }
 Rape, 30 lb. 3 9d } £5.
 Mangels, 8 lb. @ 2/- }
 Lucerne, 30 " @ 1/6)

Manure Details:

Crops-includins new grass
 ryegrass and red
 clover
 Lucerne
 Grass

Super Lime.

9 t. 6½ t.
 2 " 5 "
 11½ " 11½ "

Total 22½ tns. 23 tns

Super 22½ tons at £4½ = £101.

Lime 23 " " 12/- = £ 14. £115.

Cartage: -- Wheat £4, lime and manure 214, ryegrass, cocksfoot, and clover seeds £5, chaff £5, wool £4, potatoes £3, and ether £3. - Total £43.

Threshing: -- Wheat £22, oats £3, ryegrass £15, cocksfoot £6, red clover £5 - Total £51.

NOTE: (1) No interest allowed on live and dead stock and working capital, or on any other capital expenditure,

(2) Owner allowed £20 extra for higher managerial ability.