ROTHAMSTED RESEARCH

Modern Changes in the Treatment of Light Soils

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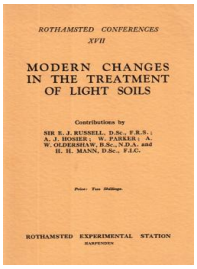

The Possibilities of Dairy and Poultry Farming on Light Soils

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A. J. Hosier (1935) *The Possibilities of Dairy and Poultry Farming on Light Soils ;* Modern Changes In The Treatment Of Light Soils, pp 9 - 15 **- DOI: https://doi.org/10.23637/ERADOC-1-210**

THE POSSIBILITIES OF DAIRY AND POULTRY FARMING ON LIGHT SOIL

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There is a vital difference between agriculture in this country and that of any other. We do not grow enough for our own needs and practically every other country has a big surplus of foodstuffs. That being so, it behoves us to look round and see what products we are most fitted to produce. As far as possible our aim should be to produce the most expensive articles in order to keep down the value of imports. This would involve the employment of more labour and a higher money value output. If we have to import foodstuffs, let it be those foods which we find it difficult or impossible to produce, or articles such as certain feeding stuffs which will help us to cheapen costs of production on our own specialised articles. A tariff on oats, for instance, looks good for the farmer, but tariffs on any of the feeding stuffs is bound to put up the cost of producing articles like beef, bacon, eggs, milk and its products. On farms where the chief output is meat, milk, and poultry, high prices of cereals and feeding stuffs raises production costs. On my own farms I have usually 700 or 800 acres of land under the plough, which, before I purchased it, had been used for corn and sheep. But that method of farming does not appeal to me because the output is too low. I have been using this land for growing cereals, and grinding these up for my stock, but two new factors have cropped up within the last year or two which have forced me to alter my methods

The first new factor was that, although the cereals were useful for my stock, the straw seemed to have completely lost its market. Consequently I have either to feed it to my stock, or let it remain in the stacks and rot. In other words the straw is now a liability instead of an asset. Whatever method of harvesting I adopt I cannot get away from the liability. If I use a combine harvester and leave the straw on the land, it is a great hindrance when ploughing and cultivating, and worse still on our light soils, when ploughed in, it keeps the land so puffy and light that it spoils the next crop unless well rolled and consolidated. On some of our acid soils it takes a long time to decay and this again introduces complication.

The best way I have found as yet, to use up the damaged or secondary straw, is to cart it out on to the newest and tenderest young pastures, spreading it where my milking bail is to travel. The milking cows tread the straw in out of the way, and, used in that way, it is a very useful dressing. The straw also is a protection against excessive poaching of the land.

https://doi.org/10.23637/ERADOC-1-210

The second new factor which has forced me to change my methods is a tariff on cereals and feeding stuffs. We now find it necessary to sell all our cereals and buy foreign feeding stuffs. This, of course, involves heavy transport costs, both when selling the grain and when buying other food stuff, and moreover the holding is not such a self-supporting concern. Instead of growing a large acreage of wheat, oats and barley, harvesting the grain, and stacking unwanted straw, I am now growing such things as peas and oats, or rye and vetches, and cutting them green for silage or hay. Except for an occasional piece of wheat, oats or barley, my principle sales-crops are milk, meat and eggs. In this way I am using the haulm as good fodder, and, if cut at the right time, I get all the nutriment in this fodder without the cost of threshing and grinding.

For the past few years light hill arable- and down-land has been going out of cultivation because it has not been profitable to farm on the old system. Hundreds of thousands of acres of such land have, I suppose, become derelict. Folding sheep and growing grain became unprofitable, and the ordinary farmer could not conceive that the land was suitable for any other system. Such was the state of affairs when I purchased Wexcombe. Mechanised corn growing with artificials alone is not the remedy. One must have humus and organic matter ; and the problem is to get this in the land with the least expense, or better still, to put it there free of charge. I am very fond of using artificials, but I regard them as the *builders* and not as the *foundations* of our crops. I have found that this light hill land can be as profitable and productive as a good deal of so-called good vale land. Having farmed some of both for years I have been in a position to make comparisons, and my conclusions are that if I was looking round for a block of land, it would certainly have to be *dry* land and probably light hill land, because it could be bought cheaply and farmed cheaply. If there is to be any land permanently down to grass, let it be of the wet, heavy, or very hilly sort. Personally, any farmer who has to farm such land for a livelihood has my sympathy. I would rather be saddled with some of the light hill land that has gone derelict. Farmers have not yet realised the value of this type of soil for our changed system. Once having obtained a block of dry and light land, I should proceed to lay on water to *every* field on the farm. I should fence it with 3 strands of barb wire and iron standards in fairly large fields, say, from 20 to 40 acres. If it was a Wiltshire hill sheep and arable farm there would be a proportion of old downland, I should grass down most of the arable for a period if it was poor, using something like a Cockle park grass mixture. Having got this far, I should commence dairying on the open air system, and poultry keeping on the folding system. In the first stage of the venture I should have to provide summer grazing and hay for the winter feeding from the new pastures. The downland would be invaluable

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for carrying the stock in winter during the first two years and until there was a sward of turf to keep the cows up. During the early stage artificials would be applied to the young grasses, and the cows and the poultry would be kept there as much as possible. When the winter rains made the land tender the cows and the milking outfit would be moved on to the downs and fed with hay and concentrates until the early spring when they could again go back on the young pastures. I have reclaimed hundreds of acres of downland and made it into useful dairying land (some of it was previously covered with heather). The procedure was to " fold " the milking plant over the land a section at a time, the wetter the weather the more good was being done. There is nothing like " hoof culture " for that type of land and indeed nothing else seems so effective. I have seen a piece of my old down pasture well trodden out in winter time, some grass seeds sown and chain harrowed in, and the followingsummer it resembled a new pasture. Many an old pasture, especially on light land, becomes so matted, and the mat has become so deep that the roots are in suspension, and consequently no amount of moisture can be of use, and artificials in such cases are useless. Using a rejuvenator or cultivator is only playing with it, and improvement will be slow. It requires consolidation. A 20 ton roller would do good if it could be used often. One of the troubles with light upland pastures is that it becomes " puffy " and the roots seem to rise. The treading of sheep is certainly a help but they are not heavy enough, and gradually that accursed mat forms. My experience has been that cattle treading is far more effective than anything else, and curiously enough they do the *most* good on hill land when they would harm some vale pastures. When our cows are driven into the compound each day in wet weather they tread in the mat and squeeze up the mud so that the fibres decompose and the whole nature of the face is changed. That one operation systematically folded over a down will usually transform the surface. But that process must be followed up with heavy grazing to prevent its reverting to its former state. I have seen worthless old downs, after two years of this treatment, produce a hay crop of 50 cwts. per acre. I usually get a down pasture well consolidated and bare, and then apply suitable artificials. These, together with the cake-fed droppings and urine, give remarkable results. With plenty of moisture and plant food, some of the light " blow away " land makes really good dairy land ; it is warm, early and very responsive—the limiting factor is moisture. Some years ago our County Organiser took a turf from my improved down, and one from the other side of the wire fence, from unimproved down. Both were cut the same size and fitted into boxes, but the turf taken from the improved part was nearly double the weight of the other ; it was noticeable how the fibre had diminished.

What I have said about consolidation on old matted grassland

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is applicable to new pastures on light soils but to a lesser degree. The best and quickest way to make a pasture is to feed it with cattle (not sheep) for the first two or three years. I have often sown a piece of foul land to grass instead of summer fallow with good results. The plan has been as follows :—

Sow the seed without a " nurse " crop (the weeds and twitch are a " nursecrop ".) By the time the clovers have changed leaf, the weeds, etc., will cover the ground. I then turn a herd of cattle on to graze it, taking care to remove them in wet weather. The cows' feet consolidate the land and this encourages the young clovers and helps to strangle the " twitch ", and, by grazing off the rubbish and the blades of twitch, the clovers are further encouraged, whilst the same process has the opposite effect with twitch grass ; the grazing and treading encourages the " seeds " and kills out the twitch. Fields treated in this manner have been ploughed out in about three years and found to be perfectly clean, but remember, the fields in this case must be grazed continuously.

I am a great believer in what I call " dual purpose " farms, *i.e.*, land that can be used either as arable or as pasture—there are many advantages.

When old pasture land gets to its maximum fertility there is no extra response to the further manuring that accrues from the cake feeding of dairy cattle and folding the poultry.

1. With dual purpose land I can plough out and take a sale crop for 3 or 4 years, *i.e.*, cash the fertility.
2. In a dry summer on hill land new pastures can be depended upou for a better crop than older pastures.
3. Grass, cereals and most crops grow much safer and become less affected with pests when the crops are frequently changed.
4. Ploughing out the land sweetens it and therefore *all* farm stock are kept more free from disease.

I very seldom summer till land, because first I am losing a crop, and secondly I am spending money unnecessarily ; when it becomes foul or poor I lay it down and graze it for a period in the way I have described.

The system I have adopted is to break up each pasture after it has been down a few years and become fertilised with the residues from the cows and the poultry, grow 3 or 4 sale crops, and lay it down again to grass. As far as possible I intermix the grass fields with the arable so that I can, if necessary, make use of the early bite from new seeds, or lattermath ; or if some new seeds need treading I can have my milking bail on an adjacent grass field and turn the cows into the new fields for a few hours daily ; also in a dry summer I get a lot of milk when the older pastures are dried up. There is nothing like animal husbandry to keep up fertility on light soils. When I intend breaking up a grass field, I put my milking

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bail and the poultry folding pens over it as heavily as possible through the late autumn and early winter. It is then heavily manured without labour and incidently all the urine is distributed too, without waste. After this operation there is very little grass to plough in. It can readily be seen that such a procedure as I have described is an excellent preparation for a future crop. I have not yet grown beet, but if I do this plan will be adopted and with my portable equipment I can make good use of the leaves without having to cart them long distances. When it is not practicable to put the bail over the land immediately before ploughing out, I fold my poultry over and this is an excellent preparation, because in addition to fertilising, the hens scratch the surface, clean the land and pick up harmful pests such as grubs and wireworms.

It will interest you to know that since I have adopted this method, I have never had any trouble with wireworm—the fact that the grassland is always well grazed has, I think, something to do with this. I have demonstrated that, on much of our light soils, cows and poultry can replace sheep with advantages to the cows, the poultry, the land and the farmer. Some of my thin land (3 ins. off the chalk) after years of liberal treatment, will keep a cow per acre, winter and summer, given plenty of moisture. Some people think of sowing land down to grass as almost criminal folly and a waste of its potential possibilities, but that is by no means true. If treated in the way I have described the output from grassland will surpass the output per acre of arable land on average light soil In 1926-7 on one section of this grass land a milking herd gave a gross output of over £40 per acre—feeding stuffs of course were bought, but no poultry were kept at that time. My 7 milking herds are in 60/70 cow units and are managed by a man and boy. It is of vital necessity that all winter fodder should be handy for the use of each herd, otherwise extra labour would have to be introduced. My system, therefore, is to cut and stack the hay and silage where it is grown, and in winter time we aim to keep each herd fairly near a stack of hay. On each section of land used for a dairy of cows, one unit of poultry can be kept—a unit of poultry is 160 folding pens with 25 hens in each house. This unit also is managed by a man and boy. The houses are moved on to clean ground every day; the area covered in a year is approximately 1 acre per house, or 160 acres for the unit. The addition of the unit of poultry just about doubles the cash output from each cow area without having to pay extra rent for the poultry farm. This system is like perpetual motion; the cows keep the grass short for the hens, and the hens make the grass grow for the cows, and incidentally it has been found that poultry-manured grass is extremely rich in protein. During the drought last summer the poultry land kept green much longer than any other. I think the ordinary corn-growing farmer would obtain great benefit from a

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folding unit, by folding over his temporary leys before ploughing.

I have not yet taken up pig keeping, but when I do, it will be on a folding system as it would work in with my present system, and still increase output from the same holding.

I do not introduce grass sheep into my system because they are apt to damage my pastures by their selective grazing, they require a much more elaborate fence, and finally they are not heavy enough for the light land. Some of my friends tell me that I have too much wild white clover in my pastures ; they say I should get earlier and later grazing with certain other grasses, but I find that where I have lost my clover I have lost my crop—the other grasses grow more profusely if the clovers are present. Others have told me (in years gone by) that such heavy manuring would tend to eliminate the clovers, but that again is not true. On my best land the clovers grow and are grazed by the stock during each mild spell in winter. About the middle of last January I moved a herd of cows into a field that had been rested for 3 months and the production of milk increased from 104 to 118 galls.—all other foods were fed the same as before. I have often noticed that, even in winter, a change of pasture increases the milk.

The same thing applies to egg production ; the hens produce more eggs when being folded over good well grazed grass with plenty of clover in it.

The value of the dung being deposited by the stock directly on to the land is much higher than when carted from the ordinary farm-yard, because there is no loss and again there is the urine which is generally lost.

In the early years of my activities I found that certain artificials gave extraordinary results, but in later years, when plots have been put down, there was no appreciable difference. This rather surprised me, as I had thought that the milk and the grazing animals would have drawn on the phosphates.

After the temporary grass leys have been fertilised and trodden by stock, my methods for breaking it up are as follows. Using a big Diesel tractor on a 4-furrow plough, and attached to the plough is a land presser fitted with a seeding attachment, designed to drop the seeds (cereals) into the channels formed by the presser. Hitched on behind the presser is a flexible harrow—thus the land is broken, seeded and harrowed in one operation. Sometimes a second operation is necessary when the soil is on the heavy side. For those of us who use heavy tractors, it is important when ploughing ley ground or stubble, to finish the job if possible in one operation, because, first, the tractor will grip so much better on the firm ground, and the operation can go on, wet or dry. Secondly, the wheel marks are inclined to make the surface ' wavey ', and the land may be unduly pressed in some places, which often results in an irregular plant.

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Of course, if a track tractor is used, the one operation is not quite so important.

I find that the cost of ploughing with a big Diesel tractor is less than half that of a small paraffin tractor, *e.g.*, one man can operate a large tractor, using a 5-furrow plough, just as easily as he could use a small tractor and 2-furrow plough. Many of the small tractors use as much paraffin in a day as a large powered Diesel tractor uses crude oil—one is pulling 2 and the other 5 furrows.

I usually plough round the field, lifting the plough at each corner, and the headlands are ploughed afterwards. Thus in a square field, the headland would be like a X, all converging to the centre. I find many advantages in this system of ploughing.

1. There is a great saving of time.
2. The headlands do not get excessive treading.
3. In wet weather it is sometimes very difficult to do a half turn at each end of the field when the land is " greasy."
4. There are no deep furrows across the field, which is a great advantage when laying down to grass. I quite realise that in some cases water-furrows are necessary.

For breaking up stubble, I generally use a 10 ft. one-way disc plough—this is in effect, a large disc harrow, so constructed that all the discs are dished the same way. This is an excellent implement, and will make a good level seed bed at the second operation. When I start clearing my cornfields, I keep this implement working night and day, disking the stubble over to allow the weed seed to sprout before I give the second operation. I broadcast winter cereals, such as winter oats, and cover the seed with the disc. The criticisms I offer on this implement are first, it is difficult to operate from the driver's seat, and second, it should be provided with a seeding box.

Most of the peas and oats I grow, are made into stack silage, which is cut green, and swept immediately into the stack with sweeps fitted on cars using a stacker and motor sweep. This cuts out a lot of laborious work and uses much less labour. I also sweep all my hay and most of my corn with these sweeps. The men get very expert, when sweeping wheat from the stooks, they will carry the stooks in on the sweeps very often as they stand.
When sweeping loose barley, I have timed the stacker delivering loads on to the stack, at one every 45 seconds.

There is one thing that rather baffles me, and I wonder if any of you here can suggest a remedy ; it is the moss which appears most winters on some of my best grass land. It is not a serious matter because it quickly disappears as the spring advances. Where the moss grows the land is very calcareous.

I am afraid that I cannot describe my methods as well as I can demonstrate them. I want everything portable on the farm, and I want to decentralise as much as possible. I have very little use for permanent buildings.

https://doi.org/10.23637/ERADOC-1-210