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The Making of New Grassland

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Introduction

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INTRODUCTION

SINCE the war there has been a great increase in the area of land laid down to grass. The reasons are to be found in the rising cost of arable farming and the fall in prices of the final products: costs of production and prices are not related under British conditions of farming, where our own agriculturists are forbidden by law to pay less than the statutory wages, but overseas agriculturists, who pay less than our wages, can sell their products in our markets without let or hindrance. Anything that can be sent from overseas, therefore, can without difficulty drive the home-grown article off the market, and by no means yet discovered can this be prevented.

We are, therefore, consuming less and less fresh food and relying more and more on preserved imported food. The results of the Ministry of Agriculture's recent inquiry¹ show that as compared with the years before the war we eat about the same amount of food, but less of our meat is fresh and more is chilled or frozen, and may be months old before we eat it; more of our eggs are "liquid" or "dried," from China and the East; more of our "butter" is margarine, and the real butter is often many weeks old, having been made thousands of miles away. Even milk has not entirely escaped the change: the liquid milk is still fresh, but we consume per head less than half-a-pint per day, no more than before the war, though there has been an increased consumption of dried milk and condensed milk.

We are not here concerned with the question whether meat and dairy produce are better fresh or old: we have to recognize and adjust ourselves to the fact that the overwhelming majority of British housewives are profoundly indifferent, and choose the cheaper. Only the few insist upon freshness.

At the present time the most hopeful outlook for British farming is the production of milk, cheese, young meat, poultry, certain fruits and vegetables, and good-quality malting barley. The market for all is restricted, especially for the three last-named; it remains, however, still good for milk and young meat provided the cost be kept low. To these, therefore, the farmer is looking, and he is keeping down costs by laying away as much land as possible in grass, thereby dispensing with labour and reducing expenditure. It is a process we all deplore, but cannot prevent.

¹ *The Agricultural Output and the Food Supplies of Great Britain, 1929.*

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The extent to which it has gone is shown by the following figures:

ACREAGES OF CROPS IN GREAT BRITAIN (ENGLAND, SCOTLAND AND WALES) IN MILLIONS OF ACRES

	<i>Total all Crops</i>	<i>Rotation Grasses</i>	<i>Permanent Grass</i>	<i>Arable, including Rotation Grass</i>
1871-1875 .	31·13	4·39	12·88	18·24
1891-1895 .	32·70	4·64	16·47	16·22
1913 . .	31·93	3·97	17·57	14·36
1920 . .	31·25	3·89	15·85	15·40
1921 . .	30·87	4·03	15·91	14·97
1928 . .	30·17	3·94	16·93	13·24½
1929 . .	30·09	3·87	17·03	13·05

Grass-growing presents little difficulty in the north and west, where the coolness and moistness favour a continuous growth of leaf rather than production of seed. It is, however, much more difficult in the eastern parts of England, where, indeed, it has long been regarded as impracticable for any but a one-year's clover or clover and ryegrass ley. Many experiments have been made in different parts of the country with the purpose of effecting improvements in the management of the grassland, and these, together with the accumulated experience of farmers who have recently laid land down to grass, constitute a considerable body of useful knowledge. The purpose of this Conference was to obtain from a group of practical men, carefully chosen for their success with grass in important agricultural regions of Britain, a clear statement of what they did, what they observed, and what they learned for future guidance.

The regions represented were Aberdeenshire and Berwickshire in the north, Norfolk and Essex in the east, Cambridge, Northamptonshire and Bedfordshire in the centre.

The broad results that emerged are here summarized briefly.

Soil and Climate.—In any part of Britain it is possible to obtain good grassland, even in the dry Eastern Counties. It is, however, difficult and expensive where the water-supply is too low or the land is too wet.

Necessity for good Condition of Land.—Where the general conditions are very favourable to the growth of grass, as in the north and west, there is little difficulty in establishing a sward. In the less favourable Eastern Counties it becomes important to help the young plant, and this is done by ensuring that:

- (1) The land should be in good heart;
- (2) The land should be free from perennial weeds, such as twitch¹; annual weeds, however, are of less importance, as they soon

¹ *Agropyron repens.*

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die out; they may even serve a useful purpose in affording some shelter in the first winter;

(3) The land should be manured before the grass is sown, unless the manuring is liable to encourage too dense a growth of the nurse crop, in which case the manure should be given immediately the nurse crop is removed;

(4) The seed bed should be well prepared and firm.

The Sowing.—Broadcasting has obvious advantages, but in the Eastern Counties "Safety First" must always be the motto, and drilling is safer. Sowing should be early and the nurse crop light and early. Barley sown thinly ($2\frac{1}{2}$ bushels per acre) is suitable; in the north "bere," an unimproved early and thin-growing sort, is better than the improved varieties: spring oats can be used, but winter oats are unsuitable, as liable to grow too densely. The possibilities of rape have not been fully studied.

There has been a complete change of opinion as to the best mixture of seeds to sow. The older agriculturists favoured a mixture of many sorts: the old Roman method had been to sow the mixture of seeds shaken out from good natural meadow-hay. Ryegrass was the first of the grasses to be introduced into Britain (about 1677), and it was at first sown alone; then some of the more enterprising agriculturists mixed it with seeds from meadow-hay in the Roman fashion. Gradually definite grasses were substituted for this indefinite mixture, and by the middle of the nineteenth century some very complex mixtures were in use: in Morton's *Cyclopaedia* (1855) the recipes contain some fifteen to eighteen different species. This kind of mixture remained in use to our own times, the justification being that the different species would sort themselves out and finally give a good pasture.

The introduction of wild white clover, however, revolutionized ideas of pasture-making. The large number of varieties was no longer necessary: wild white clover with ryegrass and a little cocksfoot gave perfectly satisfactory results. In the first year or two the bulk might not be very great, but after a while a good pasture resulted.

It was, however, shown that this question of the early years could be solved by the judicious introduction of a few other species, such as broad red and late-flowering red clover, timothy and meadow-grass: but these might cause trouble by injuring the wild white clover.

The present practice is, therefore, to keep to simple mixtures in the Eastern Counties, where pasture-making is difficult, thus sacrificing some present gain for the greater certainty of a good pasture. In the north and west the risks are less, and the grasses and clovers giving bulk in the early years may be introduced without harm. It will improve matters in the Eastern Counties when early bulk and later success can be combined with greater certainty: perhaps this can be done by suitable grazing, as suggested by Mr Martin Jones (p. 58).

Modern mixtures are based on wild white clover. With this rye-

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grass seems to be a natural associate: perennial is the more generally useful, though Italian makes good grazing, and a little is introduced in the more complex northern mixtures. Other plants, however, may damage the wild white clover, and the risk is much greater in dry than in moist conditions. Hence much greater care is needed in introducing further species in the Eastern Counties than in the west and north. Something must be added, because the ryegrass does not give much early keep and it does not at first completely cover the ground; on the bare patches weeds may come in and do much harm. The safest and most generally useful partner for the wild white clover and ryegrass combination is cocksfoot, but it needs some restriction. It everywhere provides valuable early food for cattle; it stands drought, and it is therefore useful for dairy stock on light land in the Eastern Counties. In the north it has the great advantage that its tussocks hold up the snow and make little heaps, which the sheep have learned to scratch aside to find the grass below. But it needs to be grazed hard or in the late summer and autumn its strong growth becomes stemmy and distasteful to stock, and, further, it injures the wild white clover. There are numerous strains of cocksfoot; some are leafy and some are stemmy, and part of the difference of opinion as to its value may arise from differences in the plants themselves. The wider use of the leafy strains—the indigenous strains—is highly desirable. But when all is said it remains true for the Eastern Counties that cocksfoot is, in Mr Mansfield's words, "a good servant but a bad master": indeed Mr McArthur of East Hertfordshire will have none of it. A small amount of timothy is also added for this same purpose of giving early food in spring and filling up the bare spaces so as to keep out weeds.

In the Eastern Counties nothing more is sown: the red clovers—broad-red, late-flowering, Montgomery, and so on—are omitted, in spite of the bulk they would give, because they may damage the wild white clover. In the north and west, with the higher moisture content of the soil, they do less harm and are therefore included, as also is alsike clover. Other plants can also be added there, and Captain McDougal's Berwickshire mixtures, with their thirteen components, begin to approach the complexities of eighty years ago, and stand in marked contrast with the Norfolk mixtures of five or six species, or Mr Gardner's Bedford mixture of four species.

The Management of the Grass.—All the farmers agreed that management was of the utmost importance: no matter how sound the mixture or how good the "take" it could speedily be ruined by mismanagement.

The central purpose, as always, is to protect the young wild white clover. In dry conditions the roots must be well pressed into the soil so as to ensure an adequate moisture-supply and a good spreading habit of growth; this pressing is best done by animals: grazing, therefore,

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is the best treatment for the first year or two in the Eastern Counties, and many other places. On heavier soils and in wetter conditions (*e.g.* Mr Cruickshank, p. 20, and Mr Elworthy, p. 61) the rain may do all the necessary compacting, and indeed the treading of animals might poach the land: here, therefore, the young crop is better hayed than grazed at first. If grazing is more convenient, some red clover can be added to the mixture to give a firmer tread and avoid poaching.

The grazing must be so done as to give the white clover every chance of growth: the grass must be well eaten down till the clover is established, but then the grazing should be less severe. At all costs however, the grass must be prevented from growing up and forming stalks; this lowers its nutritive value more than anything. If by July it is running up it should be cut with the mowing-machine.

The northern farmers insisted on the need for leaving some of the land rough during the winter in order, as already explained, to hold up snow and to provide some food for the sheep, but this should not be done too often, and at least one year in two the grass is eaten close down. In the south the necessity for winter roughness does not arise.

Rather unexpectedly no one was in favour of much winter cultivation. If the grassland be properly treated the animals do all that is needed: only rough patches or matted pastures—sure signs of something wrong—need harrowing. Indeed, Mr Gardner went so far as to claim that harrowing and rolling of grassland are signs of mismanagement!

Manuring.—All the farmers agreed about the importance of phosphate, especially basic slag, given early, either before sowing or just after the nurse crop is cut, at the rate of about 8 cwt. per acre: some had obtained good results with mineral phosphate, though the experimental evidence is that high-soluble slag is quicker in action and therefore better. Only few attached much importance to nitrogenous manuring of the pastures, and these were from Norfolk and Bedford. Major Keith (p. 34) finds that a February dressing of complete artificials so hastens growth that the grass is ready for ewes and lambs by the beginning of April, when otherwise it would not be ready till much later; he had not, however, found much advantage from late summer dressings. Mr Gardner also (p. 45) emphasized the advantage of nitrogenous manuring. Kainit at the rate of 4 cwt. per acre was commended for inducing the animals to finish up herbage they had left to grow coarse. Farmyard manure had the advantage of inducing early growth.

There were some interesting experiences in regard to the treatment of weeds in pastures. Thistles were dealt with by cutting: if necessary the land was hayed for two years. Buttercups, Yorkshire fog, and crested dog's-tail were kept down by hard early grazing; and *Agrostis*, a sure sign of wetness and sourness, by draining and thinning. Where, however, the grass had got into too bad a state the best remedy

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was to plough it up, dress the land well with slag, and if necessary lime, and then re-sow.

Many of the points raised in the discussion are already the subject of experiment at Rothamsted. It is hoped during the forthcoming summer to arrange a day for grassland demonstrations.

Finally, those who read this book, written by farmers in order to set forth their experiences for the benefit of others, will surely recognize that the ancient myth about their supposed backwardness and lack of receptiveness has singularly little foundation in fact.

E. J. RUSSELL.