

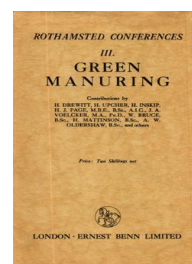
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## Green Manuring

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### Experience With Green Manuring on Light Lands in Norfolk

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## EXPERIENCE WITH GREEN MANURING ON LIGHT LANDS IN NORFOLK

BY H. UPCHER

I CONSIDER Sir John Russell has done me a great honour in asking me to come here to-day to read a paper to all you learned people, for I am only a common or garden Norfolk farmer, who has tried to go about the world with his eyes open.

I have no carefully obtained statistics to put before you, and can only tell you of the results obtained by myself over a series of years. During this time I have become so captivated with the joy of production that my business has become my hobby: also, although coming from Norfolk, and I may appear to be a heretic, I have learnt that the four-course system of farming, though excellent in some localities, can be a big stumbling-block in others. Moreover, I have engendered a suspicion that the turnip—and especially the white turnip—is to a large extent the “root of all evil.”

Now, I suppose Sir John Russell asked me to come here because he knows that for many years I lived on the edge of an agricultural desert, with which I had close personal contact through the medium of my pocket. Incidentally, I may tell you that he had very nobly answered my S.O.S., and had come to help me with advice and soil analysis—and green manuring was to be one of the means to the end.

Now green manuring has been quite a common practice in S.W. Norfolk, and mustard has been the usual crop. It has generally been made use of as a preliminary for wheat—when there has not been enough farmyard manure to go over the whole area that was destined for wheat. Also, there was a widely held idea that if you ploughed in mustard the wireworms would feed so greedily on it that they burst. I must confess that I never saw a “burst” wireworm, but wheat usually did well on the mustard diet. The wheat was sown after mustard on the better lands, loam or chalk, quite as freely as on the thinner soils.

Now this S.W. Norfolk district in which I lived has a very large acreage of light land, lying between the Brecks and the Fens. A very interesting district from the point of view of the botanist, the geologist, and the ornithologist—from a farmer's point of view it is as full of problems as a crossword puzzle. Sir John Russell will agree with me when I say that much of the soil here contains from 88 per cent. to 92 per cent. of insoluble silicious matter—or, in other words, is flint dust. Truly not a very promising seed bed. Still, this was the chief material some of us had to work on, of a varying depth of from 6 in. to 1 ft. 6 in. on the top of what was locally known as deadlime—

a hard calcareous substance, which held water about as successfully as a sieve.

One day I was talking to an old man who worked on the farm. He was eating his lunch, and he said to me : "Master, all the victuals I take, I have to bolt, I can't chew—I haven't got any teeth." Well, much of that S.W. Norfolk soil is afflicted in much the same way as that old gentleman. The soil hasn't got any teeth—in other words, flint sand is not good for bacteria, and these are the teeth of soils. The question I had to answer in trying to farm this land was : How can I get bacteria to grow ? Part of the land I had taken in hand had not been cultivated for at least sixty years. How *was* I to get anything to grow ? I first killed the rabbits. It was at the far end of the farm—too far from any muckyard, and, moreover, no muck to spare for any mad—as they were looked upon by my foreman—experiments. Yet, I must get something to grow to plough in. I bought several trucks of fish gipps from Yarmouth, spread these on and ploughed them in, and then sowed mustard. I was rewarded more than I had expected, and got quite a decent plant, which was ploughed in. I followed this with rye, which was fed off with sheep in the spring, and then lupins were drilled. These were ploughed in, and in August mixed kales and turnips sown, with complete artificial manuring, and in October cross-drilled with rye. On this I folded ewes and lambs—end of March and part April—having mangolds thrown to them and being fed with cake. I sowed with barley, laying down with giant sainfoin. The season was favourable, the barley never got a check, and I sold 15 coombs head corn per acre. Did it pay me ? At all events, I had the satisfaction of making the desert shine.

On an adjoining piece, with similar treatment to commence with—*i.e.* fish and mustard—after the first ploughing in, I fed off all green crops with sheep. I never had quite such a good yield of barley, but got up 12 coombs per acre. I am inclined to think that the other phenomenal yield was partly due to the following rains of that particular season.

However, on another adjoining piece, I ploughed in one year a broadcast crop of kales and white turnips, which came full of goose-foot or fat-hen, and sowed winter oats—result 18 coombs per acre—the heaviest crop of winters I ever grew. This all points to the fact that green manuring is well worth a trial. I hold the view that one of the reasons why much of our very light land in Norfolk is becoming derelict—I think this also applies to some of the better lands which are still being farmed—is that under the four-course system this light land has become farmed out. It has been wanting a good coat of muck every year, but it has not had it, and has been lucky to get it once in four years. Want of good manure has resulted in many turnip failures, which meant a poor treading by the sheep. The land has simply been robbed of its manure. Another year was

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wanted in the rotation, vetches and winter oats sown on corn stubble, and fed off by sheep in June, followed by mustard ploughed in or fed off, then rye sown in October or earlier for early spring feed, followed by turnips fed off on the land. With such a rotation the land would have smiled—and, I think, the farmer too.

There are many things that can be used to plough in. I once ploughed in a field of red clover, with extraordinarily good results following. In Tasmania I found they sowed peas, vetches, clover, and even lucerne to plough in for their apples. At Methwold, for tobacco-growing, rye sowed in the autumn, and ploughed in when about 4 in. to 6 in. high in the spring, gave very good results. Lupins are a first-class crop for the purpose, being a nitrogenous plant, but they must have a sufficient depth of sand or they will not do.

Probably the most peculiar crop I ever ploughed in was poppies. It was on the farm I am now on. The land here is very subject to poppies. I had sowed peas and they looked splendid to a certain date, when suddenly poppies began to appear. They grew and grew, and at last one day the whole field burst into a scarlet coat. This was more than I could bear, and they were ploughed in the next day. Mixed kales were sown, on which I hurdled hundreds of pigs. The field has not forgotten this.

Another important point to remember about this light land farming is to get your stubbles, which are not laid down with grass seeds, ploughed over as quickly as possible, and sown with some crop. Tares and winter oats are perhaps the best. They supply four alternatives—sheep feed, silage, hay, or to be left for seed. They are, I think, too valuable to be ploughed in. Rye does well either for early sheep feed or to be ploughed in, and makes a lovely seed bed for roots or kales. Whichever crop you use, the chief effect it has is that it preserves the nitrates, as the growing crop collects them from the soil, and so prevents them being washed out by the winter rains. Nitrates are the dearest things to buy, so always keep them if possible, and so add to the producing power of your land.

I think I have given enough examples of possibilities. As to the limitations, they are wide. This system is very helpful for getting humus into the soil when a farm has been let down, or contains very poor land, and to assist in keeping land in heart—very useful too for keeping in condition outlying lands, far from the homesteads and manure yards.

It is entirely a question of circumstances—climate, available labour for ploughing and sowing, and so forth. I cannot, however, imagine any land that it would not suit. I have tried all sorts of crops to plough in, and have always derived benefit from doing it. I am sure heavy land must derive quite as much benefit as light—what is ploughed in must assist very much in aerating the soil, and in helping the drainage. To sum it up, it is a good substitute for farmyard manure when this

cannot be obtained—but I like farmyard manure best, especially if made with pigs. If every farmer of 300 acres would keep from twenty to thirty sows his farm would be the better for it, and England would not have to buy so much pig in various forms from the foreigner.

Raise all the stock you possibly can, is my advice to all farmers, no matter whether it is cattle, sheep, pigs or poultry, and green manuring is a good way to start. The more fertile your land becomes the more stock you can keep, and it is cheaper to grow food for stock on fertile land than it is to buy it.

## GREEN MANURING ON A BEDFORDSHIRE FARM

By H. INSKIP

NEARLY the whole of the farm which I occupy at Stanford, near Shefford, Beds, consists of very unretentive gravel soil, which, if not frequently manured, would soon become destitute of plant food. When I entered the farm in 1903 there was considerable litigation on the matter of unexhausted improvements. The previous tenant had manured the land liberally, and naturally wanted me to pay for all the manurial residues in the soil that I took over with the farm. Dr Bernard Dyer was called in, and made a complete analysis of the soil in three separate fields. In his report he said :

“As far as the chemical constituents of the soils go, one characteristic feature is that the soils are almost destitute of organic matter, notwithstanding past applications of dung and the root residues, etc., of past crops. The nitrogen in the soils only amounts to from 0·114 to 0·144 per cent., indicating, when allowance is made for the stones, no greater quantity of nitrogen per acre than is found in some of the Rothamsted soils to which no dung has been applied for fifty or sixty years. The smallness of the organic matter and of the nitrogen included therein are explained by the open and hungry character of these soils. While this must render it necessary to use a good deal of dung in order to retain moisture in the soil, the mechanical benefit arising from its application must, in my opinion, be rapidly lost unless the dung is frequently renewed.”

I might say that the adjudicator in giving his award was influenced to a considerable extent by Dr Bernard Dyer's report, and let me off with a very moderate payment to the outgoing tenant. At the same time, I realized that I had a great problem to solve—how to maintain the fertility of the farm without spending an impossible amount of money on London stable manure.

Also, I had to consider how best to retain the greatest possible