

The Dairy.

On the best Rotation for a Dairy-Farm.

(Written, in French, for the St. Thérèse meeting of the D. Ass.)

We are attacked on all sides. If we look to the South, we see the ingress of our barley into the United States hindered, if not absolutely prohibited, by the McKinley tariff. The production of beef and mutton is so cheaply carried on by the great rancho-proprietors of the North-West that it has become almost impossible to rear bullocks or sheep with any profit in this province; while the wheat of Manitoba, now selling at some 0 cents a bushel at the elevators, makes the cultivation here of that cereal almost hopeless.

But we need not absolutely despair. If grain and meat will not bring us in much profit, if their production is carried on as it usually has been up to the present time by most of our farmers, the dairy industry still remains to us, and, in connection with that pursuit, it does not seem to me to be impossible, if a well studied rotation be followed, to still make some fair profit out of the production of meat and cereals on most of our farms.

For, where there is no stock, there is no manure; where there is no manure, there is no crop; and neither stock, manure, nor crop can be profitably produced, unless the land be subjected to a proper rotation, a rotation not empirically selected, but one that is, suited, practically, to the soil we are working, and theoretically adapted to the various demands for food the plants we cultivate make upon that soil.

You all know, that every genus of plants asks for special kinds of food. Wheat does not insist upon being supplied with the same special food as clover, neither does barley need the same special food as pease. And it is upon this difference in the requirements of special foods that, though utterly ignorant of the theoretical reason for their practice, the farmers of my own country have, for some 90 or 100 years, been accustomed to separate the white-straw crops they grew by the interposition of some other crops of an unlike nature.

Hence, arose the Norfolk or 4-course system; in which barley or wheat was grown every alternate year, but separated by intermediate crops of roots and clover. It stood thus:

- 1st year... Roots, turnips, mangel, &c
- 2nd..... Barley.
- 3rd..... Clover, standing only one year.
- 4th..... Wheat.

Now, the practical English farmer was not quite such an unthinking creature as he seems to be considered by some people. He worked away at this rotation for many years, until, time bringing changes, he found that there were certain defects in the yield of certain of his crops, the reasons for which had to be discovered. For instance: the clover crop, all of a sudden began to refuse to grow: a sad thing indeed: for a good plant of clover, mown two or three times, according to the season, hardly ever failed to produce a good crop of wheat. He soon found out—more than 50 years ago—that if the clover,—and by clover I mean the *trifolium pratense*, or common red-clover, were sown so often, either the condition of the land, or its mechanical state, rendered that plant unsuitable to it. Some other crop, then, must take its place: what shall it be? Too many grain-crops

would clearly not answer, even if the terms of their agreements—leases were very rare in those days—would admit of their succeeding one another, which they did not. They tried pease on light and beans on heavy land, in place of half the clover—both being leguminous or pod-plants—and though the following wheat-crop was not so good as heretofore, it was very little inferior, and the pease being both hand- and horse-hoed, the land benefited considerably by the extra cultivation it received.

Thus, the 4-course system was converted into an 8-course one, and things went on as well as ever.

Another difficulty arose, some 20 years later. Malting barley always sold well, but in time, the very high state of cultivation to which our best farms had been brought by the year 1850 made the growth of a good sample of malting barley—and there was always, or almost always, a difference of at least 50 to 60 cents a bushel between grinding and malting barleys—almost impossible, if that grain were sown after a heavily manured crop of roots fed off, as was and is the custom, by sheep eating additional food: cake or grain, or pease, or all three.

What was to be done? The remedy was simple: wheat was sown after roots, followed by barley and clover seed, and the wheat as usual completed the course. This could only be done on very well farmed land, but there the sample of barley was as bright as ever, and this is the form in which the original Norfolk course or rotation now stands in all but the most backward districts of England, viz.

- 1st year... Roots
- 2nd " " Wheat
- 3rd " " Barley
- 4th " " Clover, half-pease or beans half
- 5th " " Wheat.

There being as above, in reality, ten limbs to the rotation instead of the original four. And there things remain, the produce of the land having increased in acre-yield, for whereas the average yield of wheat 50 years ago was only 26 bushels an acre, it is now, as nearly as possible, 30 bushels, taking all sorts of land together. (1)

Thus, I think you will see that a sensible attention to the advantages and a sensible amendment of the defects of the common rotation of crops in England, have resulted in a marked improvement in the average yield of the most important crop of that country.

In presenting you to-day with my ideas as to the rotation best adapted to a dairy-farm in the province of Quebec, I must beg you to observe that I speak in general terms. Silo-corn will not mature sufficiently at Métis, but their swedes are superb and the Belgian carrots too, and vetches do well; so, in the districts below Quebec, those who desire to employ ensilage for the winter supply of their dairy-cows, must substitute vetches for corn.

The number of years that land should lie out in grass, again, is another point to be determined by the situation of your farms. Those who are fortunate enough to be within reach of an unlimited supply of dung, can break up their pastures sooner than those who are entirely dependant on the home-production of that description of fertiliser. But, I may state positively, the addition of a moderate ration of extra food, such as cottonseed-meal, pease-meal, crushed oats, &c., to the scanty food afforded by your pastures in July and August,

(1) It must not be forgotten that, in England, both barley and wheat are horse-hoed. *Ed.*

will prove, in all cases, highly remunerative.

You will not, of course, neglect giving your milch cows a portion of green meat mown for them every day. No better use can be made of the early cut of clover. For, I need not tell you that if once a cow begins to fall off in her yield of milk, it is a mighty difficult thing to restore the original flow.

Two or three years ago, I had the honour to contribute to the Report of your Association an article on the best provision of green-meat for dairy cattle, so I shall not go over that matter again, but will lay before you the rotation that, generally speaking, I think you will find suitable to the farms of, at all events, the Western part of the province.

The rotation I propose is calculated for a farm consisting of 100 acres of land under cultivation. The first limb is, of course, a hoed or green one, comprising roots, part of which may be sugar-beets, if things go well with the factories as I hope they may, green-meat, such as vetches, early rye to be cut very green; fodder corn; my own mixture of two bushels of oats, one of tares, one of pease, and 2 lbs. of rape, the last of which will be found very useful for your sheep to pick over after the crop is cut.

This will be followed, in the 2nd year, by barley or wheat, sown down with grass-seeds. Of what mixture you ought to use for this purpose I say nothing: soil and situation must be your guides; but Mr. Evans, the seedsman at Montreal, is fully informed of my ideas on this subject, and, if you ask him, will give you a list of such seeds as will be found suitable to your farms. These seeds, I propose to let lie out for 4 years, so the rotation will be 10 years in extent. In it there will be no cramming of two grain crops on one another, and in the middle, that is, in the 6th year, provision is made for a partial cleaning of the land; for, in such a long rotation, unless something of the sort is done, the land will become frightfully foul before the course is finished:

	Acres
First year, a cleansing or hoed-crop—roots, corn, pease, or beans, with oats, tares and rape.	10
Second year, grain	10
7 in barley or wheat, 3 flax with grass-seeds.	
Third year, meadow	10
Fourth " " "	10
Fifth " pasture	10
Sixth " " "	10
To be broken up for bastard fallow 1st July, and	
Seventh year, grain	10
oats with 14 lbs. red-clover.	
Eighth year, clover	10
to be mown for hay, for silage, or for green-meat.	
Ninth year, grain	10
oats.	
Tenth year, pulso	10
pease on light and horse-beans on heavy land	

Thus, you will have 40 acres in grass, 10 acres in pulso, 10 acres in clover, 10 acres in hoed-crop, 27 acres in grain, and 3 in flax.

As regards the first limb of the rotation, the hoed or cleansing crop, the preparation of this ought to be begun in the previous fall, after the crop of grain or pulso is severed. Plough or grub shallow, harrow and horse-rake the rubbish, couch, &c., and burn it, before laying up the land for the winter. The roots and corn should be sown on the land that is the least clean, as the first lot of green-meat, vetches &c., must be sown as early as possible, and there will be no time to clean it; sowings should follow at intervals of, say,

a fortnight. Pray do not fancy that 4 bushels an acre of the mixed grain and pulso are too much; it should be cut when the vetches are just showing bloom.

I have taken 3 acres of the 2nd limb for flax. The crop may yield, if well treated 12 bushels an acre, and as the pulso crop of limb 10 ought to give at least 18 bushels, a very fair mixture can be made of the two in the proportion of 5 of pulso to 1 of linseed, which, for milch-cows or fattening beasts, will not be found out of the way.

As for the sixth limb, the fourth in grass, I propose to sacrifice the pasture from the 1st July, and make what we call in England a bastard fallow of it. The land should be ploughed shallow, cross ploughed, two weeks later, a little deeper, by which the grass, &c., will be brought to the surface and the weeds killed, after a good tearing about with the grubber and harrow, if the month of August is as hot as usual: a fair dressing of dung lightly ploughed in will fit it for the following crop of grain.

Do not stint the clover-seed in the seventh limb: 14 lbs. an acre are not too much. The clover in the eighth limb may be mown for green-meat generally by the first week in June; it may be cut for hay; the first-cut may be hayed and the second-cut ensiled; or it may be done whatever you like with, except ploughed under. It is, believe me, far too valuable to be treated so contemptuously. If you must bury anything, take vetches, pease, any pulso crop, except clover. As for buckwheat, green-rye, mustard, &c., I do not believe that any good is derived from interring them, unless the trifling mechanical effect they have may be beneficial.

As to the pulso-crop in the tenth and last limb of the rotation, if you would only treat it as you treat a crop of potatoes, you would find it profitable. But I fear it will be a long time before I shall see here a field of pease or horse-beans drilled, hand hoed, and horse-hoed, as it is done at home. At all events you can harrow them once or twice after they have come up, particularly after a fall of rain on heavy land, if it be only to break the crust.

A propos of the horse bean: it will not answer on light land, and it must be sown early. Mr. Dawes of Lachine, whose recent appointment to a seat in the Council of Agriculture I beg leave to congratulate him upon, grew these beans this year successfully; they were drilled and horse-hoed and yielded 20 bushels an acre. No food like them for horses in cold weather, and they keep the flesh on heavy milking cows better than anything grown. I have seen them 8 feet high, on our low-lying Gloucestershire lands, and yielding 80 bushels, of 68 lbs., to the acre. Half a bushel of beans takes the place of a bushel of oats in our farm-horse rations, and hunters, stage-coach horses, and other hard workers have them all through the winter; only don't give them to an idle horse, as they are pretty sure to cause *farry*.

You see that we have got a pretty good lot of food together on our supposed 100 acre farm. Let us see:

	Tons
Ten acres of green-meat, roots, &c.	
at 15 tons an acre.	150
“ green clover at 12 tons	
acre	120

To say nothing of the 27 acres of straw from the grain-crop, 10 acres of most valuable pease straw, and the