



From the Scottish Farmer.

ON THE CULTIVATION OF RED CLOVER, AND THE CAUSES OF ITS FAILURE.

By ROBERT M'TURK, Esq. of Hastings Hall, Dumfries-shire.

(Continued from page 37 Newcastle Farmer.)

We cannot think that it was in consequence of the treading of the sheep merely, in the instances to which Mr. Thorp alludes, that the abundant crops are to be attributed. We find a much more satisfactory cause in the manure which they left upon the ground. In one field to which we devoted much attention, the turnip crop of which was eaten down with sheep, and through which we had occasion to cart a quantity of stones and other articles, the clover crop afterwards was a complete failure, except on one ridge next to a dyke which sheltered it from the west, the direction in which the field was most exposed to wind and rain, and to which the sheep had constant recourse for shelter, when the weather was unfavourable. This ridge, from the quantity of rain that fell at the time, was certainly not more consolidated than the end ridges on which the turnings were made, on the part over which the road passed: still the crop in those parts seemed to derive no advantage from the compression which they had received, and it was only upon the ridge on which a much larger portion of dung and urine had been deposited, that the clover could not be regarded as a failure.

We adduce this instance, not only as a case in point, but as coinciding with what may be regarded as the general experience on this subject, of the district in which we reside.

It is true that lime, and more especially in a caustic state, by the decomposition which it promotes in the soil, does to a certain extent render it more porous, but certainly not more so than farm-yard manure, the action of which, in the state in which it is generally used, is much more active than lime, and bones are less active than either.

As to the other expedient to which we have referred, namely, sowing the clover after the oat or barley crop has been cut—first harrowing the surface, and afterwards rolling in the seeds, we have only to say, that in portions of our fields where the crop has been lodged, and the grass seeds destroyed, we have tried the plan recommended, but the experiment was not attended with that success which would warrant us in advising others to

have recourse to it, unless on such parts as we refer to, and which would otherwise produce nothing. On such occasions the seed always germinated well, and showed a thriving braird, but the plants were sure to give way, particularly the red clover, when frost commenced. In some instances the clover was destroyed before the frost commenced; for young braird at that season of the year is very palatable to every kind of stock, and is, on that account, sure to be cropt by every kind of stock on the ground, and when once stripped of its leaves, so tender a plant is nipped by the first frost. The recommendation to substitute a young and tender plant for one older and more hardy, when tenderness is regarded as the cause of the failure, seems to us a very extraordinary cure for the disease. It does not alter the case that rolling is also recommended; for, if that operation is to be regarded as beneficial, the older plants can be as easily rolled as the younger, besides a greater degree of solidity preserved to the soil than when it has been loosened by harrowing. In so far as protection to the neck of the plant is concerned (and this seems to be all that is considered necessary), it is evident that solidity cannot be maintained through winter, in any soil that contains more moisture than is essential for the purposes of vegetation; for every frost that penetrates the soil to the depth of one inch, must completely destroy the solidity which either the treading of sheep or rolling can effect. Besides, Mr. Thorp seems to forget that the solidity imparted by the first of these means must be completely destroyed, for two or three inches upon the surface, by the subsequent operations of ploughing and harrowing in the seeds in the following spring.

It now remains for us to shew that there are various causes which have all more or less influence in occasioning the failure of the clover plant, and to endeavour to point out the means by which the evil may be remedied.

When we ascertain the composition of any plant, we will find that the proportions of its organic and inorganic constituents are in many respects different from every other plant, however nearly allied it may be to them all, and that even the different parts of the same plant contain those same constituents in different proportions. In so far as the inorganic constituents are concerned, there is no source from which they can be derived in sufficient abundance but the soil; and as these substances are found to exist in

the soil in very unequal quantities, there is no doubt but that while one kind of plant is withdrawing one substance in greater amount, another is appropriating another substance in a larger degree, and so it is with every crop. It is, therefore, evident, that unless these substances are restored in quantities equal to what have been abstracted, the soil must in course of time be exhausted. It is also evident, that while some of these substances readily accumulate in sufficient abundance from the decomposition of matter which is continually taking place, others are very slowly restored, and some scarcely at all, unless when contained in the manure which is from time to time applied. It may be observed, that in the course of the ordinary operations of husbandry, some of the more soluble of these substances may be carried down by the rain into the soil, while in a pulverised state, in greater abundance than they are produced by natural causes, to a depth to which the roots do not extend. Under these circumstances, it is not to be wondered at that the soil should be sooner unfitted for the growth of some crops than for others; and especially for those crops which require a larger amount of those substances which, in the first instance, exist in the soil in more limited quantities, or which are more soluble and carried away by rain to a depth beyond the reach of their roots.* This is, perhaps, more the case with red clover than any other plant, which will be more apparent when we avail ourselves of the aid that chemistry affords. It tells us, in the first place, that 1000lbs. of red clover, in the dried state, according to the analysis of Sprengel, contain the following proportions of inorganic matter:—

Potash,	19.95
Soda,	5.29
Lime,	27.80
Magnesia,	3.33
Alumina,	0.14
Silica,	3.61
Sulphuric acid,	4.47
Phosphoric acid,	6.57
Chlorine,	3.62
	—74.78

From this analysis we learn the very large proportion of potash which red clover abstracts from the soil, when contrasted with the other crops with which it is generally associated in the course of a single rotation.

Wheat contains in 1000 lbs.	
of the grain,	2.25
Straw 1000 lbs.	2.45
Barley,	2.97
Oats,	1.50
Rye-grass hay,	—
	8.81

* See Professor Johnston's Lectures on Agricultural Chemistry, p. 265.