

farmers are the more we shall prosper and grow, and if we are faithful to our trust, as the parents of the coming generation of farmers, we shall have done very much to make Canada one of the brightest gems in the British crown, and the pride of the glorious realm of our most gracious Queen who, as wife and mother, has set us so brilliant an example.

Finally we shall gain the hearts, the best obedience, and the respect of our families by showing them that the chief end and aim of our lives is their temporal and eternal welfare; that we have not been toiling all our days for ourselves alone, but for their good; and if we perform our duties faithfully, our children's children will bless our memories long after we are laid to rest, all trials, toil and responsibility ended, and our life work accomplished.

Ainsi soit-il.

GEO. MOORE.

The Farm.

A PERMANENT PASTURE

EDS. COUNTRY GENTLEMAN. — What are the best grasses to sow for permanent pasture for cattle in Dutchess County, N. Y., on hills, where the soil has small stones mixed with it?

E. L. C.

Sow, some time during August, the following mixture per acre: 6 qts. timothy, 2 lb. orchard grass, 2 lb. tall meadow fescue, 2 qts. red clover, 1 qt. alsike clover, $\frac{1}{2}$ qt. white clover.

If the ground is most thoroughly prepared and the land rolled after the seed is sown, so that the clovers will come immediately, they will be established before winter, and there will be little or no danger of freezing or winter-killing. On heavy clay soils, clover does not stand the winter well if sown late in the season. Almost everything will depend on putting the land in very superior condition. By this is meant that the harrowing and surface culture shall be sufficient to pack the lower part of the land, while preserving an inch or two of very finely divided earth at the surface.

Many farmers succeed in getting clover to stand through the winter on lightish soils, although sown as late as the 10th of September. It is customary throughout New-York and some of the adjoining States to sow clovers in the spring, but during the last year or two there have been many failures in getting a stand of clover with either winter or spring grain (1). It is difficult to discover just what the matter is. This being the case, the safest way is to seed in early fall, and do everything possible to furnish the plant with a mellow, moist seed bed and sufficient plant food to start it with vigor. In a few years, when the timothy and other grasses have tillered, the clover will measurably disappear, although some should always be kept in a permanent pasture as a host plant for the grasses, as they usually suffer for the want of nitrogen.

When the clover measurably dies out, it can be introduced by sowing in the spring upon the grass, which should be harrowed most thoroughly with a fine-tooth spike harrow and rolled. If this is done well and early about every third year, some of the clovers which are so beneficial to the growth of the grasses may be kept in the permanent pasture.

(1) And yet there is "no such thing as land becoming clover-sick."—Ed.

We wish we knew what to say to emphasize the need of a better preparation of the soil for these minute seeds. The need of fine tilth has been emphasized so often in the COUNTRY GENTLEMAN that it seems almost superfluous to add anything more, but in looking over the fields while taking a journey in the country during the last few days, we are satisfied that nine times out of ten the short crops are due to poor, and abundant ones to good, culture.

I. P. R.

CLOVER RUNNING OUT

EDS. COUNTRY GENTLEMAN. — Can you give me a suggestion as to the continued failures in this region, a fertile farming valley of western Maryland, in getting the bottom lands set with clover? Formerly this could be done with very little trouble; in fact, before the days of fertilizers, it was the principal hay crop. Now, while the uplands set well in clover, it seems impossible to get any success in the lowlands, where it comes up only in spots.

This particular farm is in a high state of cultivation, producing enormous crops of wheat, timothy and corn, and is farmed with a view to scientific principles, using best of fertilizers, but no good results in clover, although we sow from fifteen to twenty bushels every year.

H. A. H.

Rawlings, Md.

The question raised by "H. A. H." is very difficult to answer. Not only in Maryland, but in New-York as well, much clover seed has failed during the present season, and clover is becoming more and more precarious as a hay crop. (1) Some farmers in Central New-York sow clover seed with timothy at the time of sowing winter wheat, with satisfactory results. By this method, the plants get a stronger hold upon the soil and are enabled to withstand adverse conditions which always prevail from the time of the blossoming of the wheat until it is harvested. The heavy crop of wheat at this time is taking from the soil in large quantities both water and plant food. The young plants are shaded and the weather is usually dry. This makes it very difficult for the young seeds to maintain themselves until the wheat is cut and showers moisten the ground. On clay land, it probably would not do to sow clover at the time of seeding to wheat, and as most farmers believe that better success is secured by sowing in the spring, it has become almost the universal practice.

One is led to suspect, from the many letters that reach us on this subject, that possibly the land is becoming what is called "clover sick," although so far as we know nothing of that character as ever been noted in the United States, although it is quite common in England. (2)

The letter implies that commercial fertilizers have been used on the low as well as on the high land. Without knowing the character of the land, or the crops and treatment which have prevailed heretofore, it is safe to recommend that commercial fertilizers containing a high per cent of phosphoric acid be used, and that the wheat seed be less liberal than heretofore, (3) so

(1) But, "there is such thing as the frequent repetition of clover unfitting the land for its growth."—Ed.

(2) Ah!

(3) Answer: If the seedling is thin, the tillering in spring will make the plant as thick or thicker than if the seedling had been thicker.—Ed.

as to give the young plants a chance for their lives during the critical period of June to July.

It is possible that the land is too rich in nitrogen, and clover does not take kindly to such lands. Or possibly a longer rotation—that is, one in which more cereals are taken off before an attempt is made to reseed, might obviate all the difficulty.

There are some indications during the last year or two that we have a fungus enemy of the clover plant, which attacks the young leaves when quite small, causing them to "damp off."

It is entirely impossible to state just what the trouble is without careful experimentation, and that should be commenced at once. The man who is on the ground knows the difficulties, the character of the land, the seasons and the climatic influences, and he should be able to find an answer to this question, and, having found it, he should not "let his light remain under a bushel."

How would it do to plow the stubbles immediately, fitting the ground on the surface superbly, and sow clover mixed with timothy, about two of the former to one of the latter, at once? If success were secured, a good crop of hay would be the results next year, and no time would be lost, if a failure, then the land could be replowed and put into corn or some other spring crop.

We are very much interested in this problem and hope that the questioner will keep us fully informed as to his successes and failures in the future.

I. P. R.

THE SOWING OF WINTER WHEAT

EDS. COUNTRY GENTLEMAN. — There are four most important things to consider in regard to the sowing of the winter wheat. These are the preparation of the land, which consists of the plowing, fertilizing and harrowing, possibly rolling; then the selection of the seed, the sowing of it, and lastly the after treatment of it.

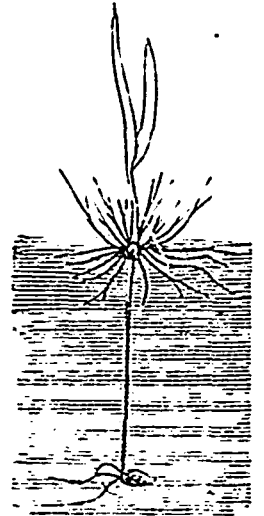
It is a common practice to sow the wheat on the oat stubble, (1) on farms where what is called the four course rotation, of wheat, grass, corn and oats—is practiced, but this is not such a simple method as the three-course of wheat, clover and potatoes. This is evident at first sight, for the oats make and exhausting crop, and always leave scattered grain on the ground, which grows with the wheat as a weed, and takes the nutriment from it at the very worst time possible for such a weakening process. If this is to be avoided the land must be plowed twice, against which extra work there is no objection, except on the score of the labor of it, (2) but it will quite certainly add much more to the yield of the wheat than this cost, so that it is advisable that it be done where the wheat follows oats. But the clean mellow soil left by a potato crop, with the residue of the clover still in the soil, and that of the liberal fertilizing of this crop, make the best possible condition of the soil for the largest yield of the wheat. In many cases this goes up to 30 bushels to the acre, and rarely less than 35, without any special fertilizer for it, the whole in the rotation going to the potatoes—which, an account of the fine culture, brings the pleasant income of \$200

(1) Probably, as bad a practice as well can be imagined.—Ed.

(2) And the loosening of the land: wheat wants a firm bed.—Ed.

or more to the acre. Thus with 10 acres only, on a 30 acre farm, worked on this system the whole receipts from the potatoes go to profit, the other crops paying all expenses.

The plowing for wheat should be thoroughly well done. The soil must be fine and mellow, but need not be deeply so. The habit of the wheat plant make this necessary. The illustration



Germination and Tillering of the Wheat Plant.

tion of the roots of the plant shows this. (1) The seed may be two or three, or 5 inches in the soil, and the spire appears at the surface forming a bulb from which spread several other spires, five or six, or it may be twenty, and as many as forty, or even more when there is room for them in thinly-sown seed, as two quarts to the acre. And in time the deeper roots, which are few and weak and only serve a temporary purpose, disappear, and the surface roots in time fill the soil to a depth of three or four inches, and as the plant grows stronger and the soil has been well plowed and is filled with food for the crop, the roots spread and go down as deep as they will find the food easy to reach, or until they have enough for their wants.

Either after or before plowing, or at both times, the manure and fertilizer come. Manure is better turned under to a reasonable depth, but it is indispensable that the plowing be done by lap furrows laid on edge so that the soil and the manure between the furrow slices become evenly mixed by the harrow, and that the young plants shall find ample food as soon as they need it. The fertilizer in this case is best sown on the surface, but if the dependence is solely upon it, it should be drilled in the row with the seed. This may be explained in this way: At first the young plant—like a young animal—is weak and needs the food put into its mouth, as might be said, that it may get all it needs without any difficulty until it gains strength to forage for itself. (2) The young wheat plant finds in the soluble fertilizer this available food at the instant it is wanted, and thus it grows luxuriantly and all the sooner becomes able to throw out the permanent feeding roots, analogous, to the first teeth of the young animal, by which it gathers the food it seeks, and finding it, grows apace and spreads far and wide wherever the food tempts it. Just here it may be remarked that it is hardly credible that plants are possessed of instinct as animals are—that is, the

(1) This was fully explained in the first volume of this Journal, 1879, p. 69, with engravings of the coronal and seminal roots.

(2) All nitrogenous fertilizers should be sown on the top in spring.—Ed.