

In nitrogen, therefore, it is possible to secure an accumulation of fertility. As long as legumes grow, and as long as nitrogen is in the air, we need never be short of a supply if we follow a certain kind of rotation. And, if we keep live stock to consume all the food that we grow, and something more that our neighbors will sell, there will be an accumulation of phosphoric acid and potash also.

Let us, therefore, give more and more attention to the growth of live stock, and to the growth of legumes. Let us take care of the fertility of our soils and increase it, and we shall become more and more the envy of less fortunate countries.

But it is evident that our soils cannot be enriched without observing some kind of a well-ordered rotation. Unless we do, there is an excessive drain on some one or more of the ingredients in the soil, and there will not be much of a call for others. The proportions of the elements of growth in the soil would thus become ill-balanced, and this would, in some degree, at least, be equivalent to locked up and unused capital, if not, indeed, of positive waste.

Improvement of Pastures.

On this continent this question has not, as yet, received that attention which its importance demands. It may be that we cannot have permanent pastures just exactly upon the European plan, but we can have them, all the same, and immensely superior to the pastures of the prairie. There is no real difficulty in laying down a permanent pasture in Ontario, or in any of the provinces further to the east. The permanent pasture question rather becomes one of maintenance than one of laying down. And here we are a little at sea, for experience in this country, in renovating permanent pastures, is almost entirely wanting.

Of course, as regards permanency, much will depend upon the character of the grasses. Those of greatest permanency here are blue grass, orchard grass, and common white clover, but alsike clover has also considerable permanency. Of the fescues, meadow fescue comes first in value, and timothy has not a little of permanency.

But permanency alone is not enough in a pasture. Luxuriant production is also necessary. If pastures are eaten bare from year to year and no attention given by way of im-

proving them, they will deteriorate rather than improve. On the other hand, it is surely possible to so improve them that they will yield more and more from year to year. If this can be done in a land where labor is dear, without breaking them up, it is worth while asking how.

Where cattle are grazed in the summer season for meat-making, the pastures should improve. If meal is fed, there is just that much more added to the land by way of fertility, except it be the constituents of the meal that is used in making flesh and bone. In this way a very considerable amount of fertility is brought to the land in a single season, and, if green food is brought on the soiling plan, and fed on different parts of the field by the system known as "teathing," the pasture will be enriched just that much more. Such a system, followed for a number of years, would certainly result in very greatly improving the pastures.

Of course, there is another way of getting farmyard manure on the land. It can be drawn upon it, as on other parts of the farm; but that would mean that those parts which had given the material for the manure would be just that much the poorer. Where foods are purchased and fed in winter, it would be different. A part of the manure made could then be legitimately made and spared for the pastures. When applied freely, there will probably be more value obtained from it than if used in the reduced form, for it will act as a mulch when thus applied, as well as a fertilizer. And manure may be drawn and scattered upon pastures with much advantage in the winter season.

Our knowledge as to the way in which other grasses may be added to thicken the sward is meagre, indeed. Our experience in this line is limited. That they can be renovated by sowing certain kinds of grasses at certain seasons of the year and harrowing these in is quite probable; but the experience in such a mode or modes of renewing grasses seems to be entirely wanting in this country. This much, however, has been ascertained, that if pastures are not eaten too closely, and some of the plants are thus allowed to ripen, the seeds will fall down again, and many of them will grow, and in this way the sward will be thickened. But only some varieties seem able thus to fight their way in the contest for supremacy. In the struggle for the survival of the fittest, the most valuable varieties do not always survive.