

### THE MAINTENANCE OF SOIL FERTILITY THROUGH THE GROWING OF LEGUMES

By Frank T. Shutt, M. A., Chemist, Experimental Farms, Ottawa.

Among the many agricultural problems now receiving attention from practical farmers and scientific investigators, none occupies today such an important and prominent position as the improvement of soils through the legumes. We therefore feel our readers will be interested in the following extracts from a lecture delivered before the Montreal Natural History Society, last week, by the Chemist of the Experimental Farms.

For many years, Mr. Shutt, Chemist of the Farms, has paid special attention to his subject, and done a large amount of experimental work in relation thereto. He consequently is in a position to present data and information both interesting and reliable. The whole lecture was replete with informations and will we understand, be published, in full, at an early date.

After bringing forward the chemical data obtained in the Farm Laboratories during the past four years and showing the amounts of plant food contained in clover under different systems of experiment. Mr. Shutt presented the following table, prepared from these results:

Average estimated amounts, per acre, of nitrogen, phosphoric acid, and potash in clover crop, including roots to a depth of 9 inches:

TABLE No. 1.

|                      | Nitrogen |      |       | Phosphoric acid |      |       | Potash  |      |       |
|----------------------|----------|------|-------|-----------------|------|-------|---------|------|-------|
|                      | Foliage  | Root | Total | Foliage         | Root | Total | Foliage | Root | Total |
|                      | Lbs.     | Lbs. | Lbs.  | Lbs.            | Lbs. | Lbs.  | Lbs.    | Lbs. | Lbs.  |
| First year crop..... | 90       | 48   | 139   | 30              | 16   | 46    | 75      | 40   | 115   |
| Second " ".....      | 50       | 60   | 111   | 17              | 20   | 47    | 45      | 51   | 96    |

The fertilizer universally used in this country is barnyard manure or stable manure. Such contains, if of good average quality, about 10 lbs. nitrogen per ton. It is evident, therefore, that by this clover method we can furnish the soil with more nitrogen than would be supplied by a dressing of 10 tons of manure per acre. And in addition to this nitrogen—the greater part of which is obtained from an otherwise unavailable source—there are, as we have already pointed out, considerable

amounts of potash, phosphoric acid and lime, liberated in the decay of the clover, in forms much more valuable as plant food than they were originally, and therefore in a very true sense to be considered as a distinct addition to the soil's store of available mineral plant-food.

It might be urged that the burying of such a large amount of rich food-material as is contained in a crop of clover is wasteful and bad farming practice. This, in a certain measure, is true, if the farmer has the stock to consume it, for by feeding it there is the opportunity of converting a part into high priced animal products and returning to the soil by far the larger portion (practically 75%) of the fertilizing elements of the crop in the waste product of animal economy. (1) On too many farms, however, there is not sufficient stock for this purpose. We have in this fact indeed the reason for much of our exhausted soil in the older provinces, where farming in many districts has consisted in growing grain, oats, or hay, year after year. For such districts, where stock is now kept in greater numbers, we strongly advocate the growing of clover for recovering fertility, for we know of no fertilizer or manure of equal value that can be so cheaply purchased. The benefits that I have enumerated are from 8 lbs. to 10 lbs. of clover seed per acre, costing \$1.00 to \$1.25. The lowest price for nitrogen in fertilizers is 10c. per lb. and, as we have seen, practically 100 lbs. or \$10.00 worth can be obtained by this method of green manuring, not

to mention the other benefits.

But nearly one-half of the fertilizing value of clover is in the roots, so that if the crop is harvested and sold off the farm there is still a large addition to the soil's store of available plant food, and the land is considerably enriched.

It only remains for me to say in this connection that the clover requires, comparatively speaking,

(1) This is exactly what we have always contended for. Ed. J. of A.