

ripening of their seed, all the noxious weeds growing on the highways or road allowances within their respective divisions, such works to be performed as part of the ordinary statute labor, or to be paid for at a reasonable rate by the treasurer of the municipality, as the council of the municipality may direct."

Section 10, subsection 4: "Every overseer of highways who refuses or neglects to discharge the duties imposed upon him by this act shall, upon conviction, be liable to a fine of not less than \$10, or more than \$20."

Noxious weeds include Canada thistles, ox-eye daisy, wild oats, ragweed, and burdock.

FOR FARMING.

Complete Manures.

The term "complete manure" is used to name such a combination of fertilizing materials as will supply all the elements necessary to normal plant growth. As the principal ingredients needed to support fertility in ordinary farming operations are practically limited to nitrogen, potash, and phosphoric acid, a manure containing these three may be understood to be, in fact, a complete manure. The simple fact that a manure contains these elements is not enough; it must contain them in certain definite proportions. A manure may contain sufficient nitrogen, for example, to produce a yield of thirty bushels of wheat per acre; sufficient phosphoric acid for twenty-five bushels, and potash for twenty bushels only. Such manure will have an agricultural efficiency of twenty bushels, and the excess of nitrogen and phosphoric acid will, so far as that particular crop is concerned, be wholly useless. Not only useless, but largely lost; as, unless the catch crop method is practised, the fertilizing elements not assimilated either take unavailable forms, or are dissipated by drainage and other causes. Even catch crops are but slightly efficacious; the soil, already exhausted of available potash by the wheat, is unable to supply materials needed, and, though the catch crop may require relatively less potash than the wheat, this difference between crops is so small that little economy is possible.

The lesson indicated is: the crop-producing value of a manure is measured by its lowest fertilizing ingredient. It is true that some soils contain naturally varying stores of plant food in an available form. It is also true that these stores are rarely or never balanced economically. If such supplies were easily measurable, a fertilizer could well be compounded to profit from the same, but such stores of plant food are subject to constant

change and dissipation; a method of culture giving results one season may prove disastrous the season next following.

It must be understood that these remarks apply more particularly to the farms of the northern and eastern parts of this continent, which have been so systematically exhausted by diversified cropping that the elements of plant food in an available form are almost uniformly deficient. In the west and parts of the south, cropping has been as yet less searching, either owing to the period under cultivation having been shorter, or to the absence of a wide diversification of crops grown. In this latter territory instances are frequent in which incomplete manures have been used for many years with some success, but the principle remains the same; the plant must have the chief elements of fertility in certain proportions, at a particular time, and in an available form. By trusting to chance in these proportions, the average of agricultural production has been brought to a very low ebb indeed.

The farms of the east and north have been practically exhausted of their natural supplies of plant food in such form as to have a specific crop-producing value. The constant use of farm-made manures has contributed no little to this exhaustion. The nitrogen of manures is always supplemented by nitrifying organisms in the soil, nitrates in rain water, and other sources. Farm-made manures usually contain an excess of nitrogen, as compared with the other elements. The formula (under actual growing conditions) in fertilizer language is practically as follows:

Ammonia.....	10
Potash.....	6
Phosphoric acid.....	3

With many staple crops this is not a properly balanced manure. The proportions for wheat are: ammonia, 10; potash, 4; and phosphoric acid, 3. The minerals are deficient here as compared with the manure, but the discrepancy is not on the wrong side. With corn, however, the conditions are very different; the proportions become: ammonia, 10; potash, 10; phosphoric acid, 4. Taking into consideration the quantity of ammonia obtainable from other sources than the manure itself, this crop seems fairly well adapted for home-made manures. But how is it with potatoes? The proportion in this case is: ammonia, 10; potash, 14; phosphoric acid, 5; the potash is deficient. Clover is one of the most important crops to the farm—rather, the most important one. The proportions for clover are: potash, 17; phosphoric acid, 5. Clover, being a leguminous plant, accumulate