

Fertilizers.

Bone Dust and Super-Phosphates.

Very little progress has yet been made in Canada, in the use of bones and the various fertilizers made from them. This is much to be regretted, as the advantage from their use, can hardly be over-estimated.

It is now about sixty years ago since ground bones were first used by farmers in England as a manure. On the first introduction of this powerful agent the modes of preparing them for the soil were rude in the extreme. They were principally broken by hand with sledge hammers, and applied in large quantities to the land. Subsequently, however, mills were erected and the bones ground and a much finer powder was obtained. In this state bone dust was used at the rate of about eighteen bushels to the acre. It remained, however, to Baron Liebig to discover the now popular method of preparing them by dissolving bones in sulphuric acid; and it is found by actual experiment that one bushel of bones treated with one-third its weight of acid is fully equal to four bushels of the dust. Nor is this the only advantage gained. Turnips, for which these dissolved bones are chiefly used, reach the growth to which they attain, when thinned, from fifteen to twenty days sooner than when either simple bone dust or barn-yard manure is employed, thus defeating the ravages of that terrible pest so ruinous to this crop, the turnip beetle. Super-phosphate is eminently the manure for this climate, and especially for this crop, because, although guano is found to be equally good in humid or moist climates, it does not act near so quickly during dry weather.

In Canada, however, it is not necessary for us to depend entirely on the bones furnished by dead animals. Providence, in this instance, as well as in many others, has highly favored us. The phosphoric deposits in many parts of our country promises to be mines of untold wealth. These deposits are supposed to have been caused by the fossil remains of ante-diluvian and pre-historic animals, and are of vast extent.

There is, however, another substance very commonly found in most parts of Canada which looks like water-worn stones, but which is known by the name of *Coprolites*. They obtained this name because it was supposed they were the fossil excrements of animals; this has since been proved incorrect, but the name still sticks to them. A valuable article is manufactured from this fertilizer in England called "Lawes' Super-Phosphate," and, no doubt, some day, their value will be recognized in Canada; as, however, they are the hardest substance from which manures are manufactured, they require very powerful machinery to crush them. After passing through the mill they should be treated with sulphuric acid in a similar way to bones.

There are several methods of preparing bones. If bone dust be mixed with its own bulk of earth, and is thoroughly wetted with the liquid manure that leaches from the farm-yard, violent fermentation will set in, dissolving the bones thoroughly and making a valuable nourishment for the turnip crop, but not equal to bones dissolved in acid.

Another way of proceeding, after procuring the desired quantity of bone dust and sulphuric acid, is to construct a wooden trough, say 7 feet long by 2 feet wide and 2 feet high, made of 2 inch plank, perfectly tight and put together with wooden pegs as the acid soon uses up iron nails. The bones should then be sifted to take out about a third of the finest particles for drying, for 48 bushels of bones 3 carboys of acid of 180 lbs. each will be required. The carboys are then emptied into the trough and a quantity of water equal to 4½ carboys mixed with it. Two

men will then rapidly shovel the bones into the trough. So soon as the bones have dried up the acid in the trough it is as well to re-mix with a shovel; then cover with a couple of inches of the small meal previously sifted out, and let the mixture remain for two days in the trough. On emptying the mixture out it will be found to be in the state of a dark paste, and should be mixed with the fine siftings. After the mass has been turned several times at intervals of a week, it will be found quite dry enough to sow by hand or drilled in with a machine. None but the oldest clothes and shoes should be worn during the first process of mixing the bones and acid; practically, however, the water should be put in the trough before the acid.

Another and a simpler method of preparing dissolved bones is by passing the bone dust through a wheat-sieve and throwing the powder into an iron vessel with half its weight of sulphuric acid, and the same quantity of water. After standing for a day it may be transferred to a wooden vessel and more water added, and then allowed to macerate until all the larger pieces of bone are soft. The mixture can either be diluted with water and applied to the land from a water cart, or mixed with mould and sown over the land in the state of super-phosphate of lime. When thus applied, it should be put in along with the seed. It answers well in this way for pastures and its effects are instantaneous.

Manure the Basis of Success.

The business of the farmer is to feed and clothe the human family—"to make two blades of grass grow where only one grew before." If the farmer wishes to make a good crop of hay, he must manure his land thoroughly. Two to three tons of timothy hay per acre is a good crop. If the farmer wishes to make a good crop of corn, he must manure his land well. Good land, well cultivated, in good seasons, ought to make from forty to one hundred and thirty bushels of corn to the acre. If the farmer wishes to make twenty, thirty, forty bushels of wheat to the acre, he must have his land in good condition. Large crops of wheat are not grown on poor, badly-cultivated land. If the farmer wishes to make large crops of potatoes, sweet or Irish, or fine cabbage or turnips, he must make his land rich. The first, most pressing, most indispensable want of the farmer is manure. If the farmer can make or buy plenty of good manure, he can have fine crops. Farming without manure is a discouraging, profitless avocation.

To make manure, then, is the leading idea of a farmer's life. All farm stock, horses, beef, cattle, hogs, sheep, should be stabled or enclosed (certainly at night) in yards well littered with straw or weeds. Every animal, all poultry, should contribute its quota to the manure bank. All weeds, litter, loose dirt, should be placed on the manure bank. Wet straw, wet cornstalks, &c., is not manure. Manure is a compost—is vegetable matter animalized by well-fed animals. Every horse and cow ought to manufacture manure. Swine and sheep make the best of manure. Hen manure is probably the richest of all manure, containing 8.4 per cent. of ammonia. But in addition to the manure from the barn-yard and hog-pen and poultry-house, the farmer should sow clover freely, let it attain its full growth, and see that one crop at least is left on the soil. Some farmers use lime, others buy ground bones, others buy phosphates, the various alkalis, &c. All are good, if properly made and properly used. But if the farmer wants good crops, his land must be well manured—rich.

I live in a limestone region, and because we see here and there numerous limestone rocks projecting above the surface, some of our best farmers have supposed that there must be lime enough in the soil. This is a mistake. I have burned and used some six thousand bushels of lime, at a cost of ten cents per bushel, which I have applied to some 60 acres, one hundred bushels per acre—and my impression is, that barn-yard manure, clover, and all fertilizers act with greater power on soils after they have been limed. Lime is used in Europe with decided advantage. Lime should be used on grass fields that are not to be ploughed for a year or more, or on fields, after ploughing, designed for wheat or corn. Lime would be especially advantageous in all sandy soils with clay subsoils.

Clover is a valuable fertilizer—it is easily managed,

cheap—furnishes fine grazing. It is said that there are three tons of clover roots, per acre, on a well-set field. Bones are in a high degree valuable as fertilizers. I saw it stated, some time ago, that a farmer applied 600 lbs. pure ground bones, per acre, and gathered six bushels of clover-seed from it, in one crop of his rotation. T. MADISON, in *American Farmer*.

Sow Plaster.

Let no farmer who wishes to raise a luxuriant crop of clover on his thin soils fail to buy a few barrels of land plaster, and sow on it just as it begins to show on the ground, and before the hot days set in. The beneficial action of plaster on clover is due chiefly to the capacity or quality which the plaster has of fixing the ammonia brought down from the atmosphere by the rains, dews, snows, and thus securing a large supply of nitrogenous food for the growth of clover. If any farmer doubts that he will be compensated for this outlay, let him buy but a bushel of plaster and sow one slip across his field, and he will find the clover so rank as to look like a raised bed, or parterre of living green.

A Wisconsin farmer states that he sowed plaster on a field May 20, and obtained three times the grass on this field more than on that where it was not sowed. He used to raise only one ton of hay per acre; now raised, by plaster, two or three tons per acre; always top-dressed it on grass lands. He also states that when plaster was sown on clover, the clover all cut and hauled off, and the ground broken and sowed to oats, every cast of the plaster made in sowing it could be plainly seen in the field of oats. Also that when plaster was applied to corn, in the hill, the place of every hill could be seen in a crop of wheat which followed. In a drought, dew would be found on the ground where plaster has been sown, while all other ground was dry and hard.

Making Manure.

A New Jersey correspondent of the *New York Tribune* gives his plan for making manure, which shows that he knows how. To carry it into practice I have a place for the manure heap convenient to the stable; clean the stalls every morning, or when necessary, and throw on the heap; always keep it well together, with a flat and broad top; it will soon commence to rot, and by the time there are eight or ten loads accumulated take a day and haul to some suitable place for manufacture. As the manure is hauled keep it well together, and not less than three feet deep; keep the top always flat or a little concave, as in this way the valuable quality is better retained. When manure is heaped conically or spread carelessly far around, and remains so for any length of time, its value then would only be about equal to straw. The heap should be regulated in depth according to quantity. By hauling a day at intervals in winter the yard may be clear by the time of turning stock out to pasture. When the pressing work of Spring is past, turn the manure-heap over, mixing it thoroughly. It should be finished square or oblong, with straight and nearly perpendicular sides, well packed all through, and not less than four feet deep, as the deeper it is the better; finish the top about level, with six or eight inches of soil, which will prove valuable in saving the good qualities of the manure. When application time comes there will be found a rich heap of manure, black and greasy.

Bone-Dust.

An intelligent English farmer, writing to *The Mark Lane Express*, states his experience with bone-dust and super-phosphate made from bones. He believes bone to be the "cream of the cream" as manure. On pasture land, in Cheshire, where he lived seven years, he found it indispensable. In Wiltshire he found it developed the best grasses and produced a superior herbage; it produced the best roots, and on the wheat crop, in the shape of super-phosphate, it secured a good stand. He used \$2,500 worth of it, and believes it to be the best worth a farmer's attention of any outside manure. He found on clay lands impregnated with oxide of iron that until the land had been limed the bone had no effect, but so soon as lime was applied bone was used with success. Finally on experimenting with it on sandy soil he found it perfectly useless, and even in quantities of 700 lbs. per acre applied to old pastures or young grass lands it had no perceptible effect during many years.