

year (1871) was especially favourable to the growth of fall wheat. The average of 1874 (the year whose Report is now before us) is under 17½ bushels. The Canadian farmer has, we admit, much to contend with in the climate during the winter, spring and summer, but the best means of overcoming such obstacles is part of the study of the agriculturist, and their injurious tendencies can be, at least, partially resisted.

The analysis given can not be considered as more than an approximation to accuracy. There are only returns from forty-three Electoral Divisions, whereas we should have them from eighty-one, leaving nearly one-half from which we have no reports; and the returns are estimates. We might expect something more definite, and less a matter of uncertainty from the Bureau of Agriculture.

The returns are as follows:

Fall Wheat—Hastings W., 30 bush.; Wellington N., 30 bush. Three divisions, 22 bushels each; seventeen divisions 20 each, and twenty still lower in the average. The light yield of some divisions has brought the average as low as we see it.

Spring Wheat.—The highest yield returned is 25 bushels per acre, from Frontenac, N. Simcoe and N. Waterloo respectively, and from N. Wellington, 24 bushels.

Barley.—We have returns of a yield of 40 bushels from seven divisions; from thirteen divisions the return is of each under 30 bushels, and from twenty a yield is reported not lower than 30, but less than 40 bushels.

Potatoes.—There are estimates of the average yield from thirty-four divisions; of these, ten are under 100 bushels, of fifteen from 100 to 150, and six of 150. S. Huron and E. Middlesex 180 each, and N. Wellington 200 bushels.

Turnips, Mangolds and Carrots.—Of these crops the yield was various, presenting the greatest contrast in different counties, the heaviest produce being of mangolds 1000 bushels, in S. Grey, and carrots, 700; of turnips the highest returns are 600 bushels.

A great advantage to be derived from these returns is that farmers may be stimulated in a section of the country to be able to present as favourable returns as those from other sections. The great difference must proceed from some cause, and that most probably not climate or soil. We do not find the more southerly districts having the heaviest crops. Of the twenty Electoral Divisions yielding an average of less than 20 bushels, may we not attribute the low average in some instances to the farming? Many without any knowledge of agriculture engage in it, after having passed their earlier years in some other pursuit.

Something may yet be learned from the lessons of the past season. The Report tells us: "It is noteworthy that the higher, and consequently 'drier portions of fields, escaped injury more or 'less from spring frosts, while in the lower portions, where the soil was generally deeper and 'wetter, the crop was generally injured, and in 'not a few instances absolutely destroyed." That the lower portion of fields has suffered most from frost is owing in a great measure to the soil retaining the water that should have been drawn off by draining. Whatever the crop may be, it will be injured more by frost in ground wet and undrained than on dry soil. And not only is it liable to injury in time of severe frost; the same holds good in times of excessive drought or rain falls, and on such land, manure, if applied, is merely wasted. One of the first and most necessary steps towards good farming is the drawing off the water that lies stagnant in or on the soil. Excessive moisture of the soil is a cause of low lying land suffering most from frost, but experience teaches us that it is not the only one. We know that in

garden and field, that part that lies lowest, even if dry soil, is the first to suffer, and suffers most, and that is owing to atmospheric influences.

We would add that the season of 1874 has confirmed the opinion heretofore expressed in the ADVOCATE, of the beneficial effects of the shade of woods, and even of screens and clumps of trees. In one instance, a crop planted directly south of a cleared opening in the woods, was severely injured, the sharp north-west winds having uninterrupted power to sweep over the field and seriously injure the growing plants.

#### Lime as a Fertilizer.

Were the agricultural chemist asked—Is lime of value as a fertilizer? he would doubtless reply that inasmuch as lime is a constituent part of every plant, it must be necessary to apply it to the soil, wherever it is deficient; and that a chemical analysis discovers it in every soil not wholly barren.

The practical farmer, in reply to the same question, would refer to his experience and that of every successful tiller of the soil. He would tell you of facts too generally known to admit of doubt, demonstrating that a judicious application of lime increases the produce of cereals and improves their quality; that on ground that had before the application of lime produced sorrel and other weeds, denoting the poverty or inferior nature of the soil, the weeds have since given place to clover and most nutritious grasses. Both the man of science and the experienced farmer, judging from different reasons, arrive at the same conclusion—soil, to be fertile, must contain lime.

Plants, during the first period of their germination, receive from the soil the elements necessary to their growth; after this brief period, they draw the needed supplies from other sources—air, water and soil; but these must supply the nutriment required for the maintenance of vegetable life and for vegetable growth. Were the soil always provided with those substances necessary for vegetation, the application of manure would be unnecessary; but they are often wanting; the composition of the soil is variable, and what is wanting we must supply in order to obtain good crops. Whether the soil be naturally barren, or rendered infertile by injudicious cropping, we must enrich it by the application of those substances essential to its fertility.

In farm-yard manure we have, in greater or less proportions, those elements essential for fertilizing soil. It is largely, if not wholly, composed of substances containing nitrogen, as the excretions of animals and litter; and in it are also phosphate of lime, potassa and lime, besides other substances less necessary. Lime being a constituent of every plant, it must consequently exist in hay, straw and the excretions. It has been extracted from the soil by the plants in their growth, and it is necessary that it be restored. This farm-yard manure partially does.

It may be asked if lime be a component part of the soil, so that plants extract it from it, and also the stable manure, what need is there of an additional application of it? We reply—lime seldom, if ever, exists in available form in soil, in the desired proportion. Even in a limestone soil it is not in a state to be available. Hence the necessity for its application. And the quantity naturally in the soil is constantly being exhausted, and therefore needs not only to be restored, but also to be applied anew in much greater measure than it originally possessed. The value of lime as a fertilizer is further proved by the fact that land wanting it produces inferior crops. It is said, on good authority, that in a tract of country the produce of wheat decreased from twenty barrels to seven

in consequence of a discontinuance of the use of lime.

Lime, great as its value is as a fertilizer, is not a substitute for other fertilizers; it is but one of the substances essential to fertility. The writer has known instances where it was applied and produced no perceptible improvement in the soil or its crops. Its failure was easily accounted for—the soil possessed little or none of the other elements of fertility; there was in it nothing to supply nitrogen to the plants, and so the land continued barren, though lime had been applied.

It has also been urged against the use of lime as a fertilizer, that though it produces beneficial results for a time, the land, in some instances, after a number of applications, becomes impoverished instead of being benefited. Lime, it is true, not only is in itself an element of fertility, but it also, as a chemical agent, so acts upon other organic substances in the soil as to make them available for plant food. In the course of time these organic substances are exhausted. But this exhaustion is not waste; it is the using for a good purpose substances that had been of little service before the application; and though now exhausted, it is only necessary to apply a greater proportion of similar or of other fertilizing substances.

It remains to say something of the mode of application from the writer's own experience and observation. The system pursued by him was to lime each portion of the land in turn every seventh year. Lime has a tendency to sink in the soil, so that after a few years what still remains, after the yearly exhaustion by crops, is beyond the reach of the plants—part of it, though but little, has passed away with the drainage, natural or artificial. We therefore find it well that there should be a fresh application of lime every seventh year. By this means the soil is never deficient in it. To sow wheat in a soil not containing lime in some of its forms is sure to bring a poor return—the produce light, the grain of inferior quality, and not maturing or ripening so evenly or early as if containing lime. Its application is beneficial to every crop. The quantity applied was from thirty to forty bushels to the acre. Generally it was scattered over the field, fresh slaked from the kiln, at the time of sowing the seed. The harrowing mixed it sufficiently with the soil. Sometimes, instead of being so scattered, it was mixed with compost, heaps of earth, sods, &c., collected from headlands, clearing water courses and ditches. The compost having been turned once or twice, was used as a top-dressing for clover and grass fields. Lime scattered on clover land before plowing produced excellent results, the clover stems and roots decomposing faster, and forming, with the lime, a superior fertilizer and stimulant.

Lime is beneficial to heavy clay as well as to light soil, but if it needs draining, lime is quite useless. First drain the soil, if wet, and then apply lime; if the soil be light it will increase its density, if heavy clay it will lessen its tenacity.

#### The Self-Binding Reaper.

Wishing to see this implement at work in the field, we went to Dundas, near which place a trial took place. Three delegates, Messrs. Stock, Ry-mal and Weir, were appointed by the Board of Agriculture to attend the trial and report on the same. A large number of farmers were in attendance. We have not yet heard the Government report in regard to the trial.

We were much pleased with the work done by the machine. The grain was taken off the ground cleaner than we have seen it done by any other reaper. It also left a longer stubble on the ground; this was objected to by some, and considered advantageous by others, as by so doing it would save