The Cost of Growing Potatoes.

It is not possible to give any detailed cost of growing an acre of potatoes that will apply to all cases, as it costs more in some soils than in others, and some farmers have better implements than others; but the following estimate is not far from being correct in most cases:—

Plowing one acre of land	$ 2 00
Harrowing and furrowing	1 00
Planting and covering	2 00
Cultivating three times	2 00
Applying Paris Green twice	3 00
Digging and drawing in	5 00
	$15 00

To this should be added one-half the value of any manure applied to the land, as half its virtues may be charged to succeeding crops; and if you please, you may add interest on the value of the land. I am sure that any farmer may do all the work for an acre of potatoes, as above stated, for $15; and in some cases the potatoes will not cost over fifteen cents a bushel, while the average will not, even when a good dressing of manure is applied, be over twenty-five cents per bushel.

Spring Killing of Wheat.

Spring killing—as distinguished from winter killing of growing wheat—is accomplished by the action of frost on the alternate thawing and freezing of the surface of the ground. In thawing the surface soil falls or settles; in freezing it is lifted up, having a vise nip on the tender wheat plant by which its roots are ruptured; and by a frequent recurrence of such process, the plant is sometimes lifted entirely out of the ground and left dead.

Good wheat soils—say rolling, sandy, clay loam, level, sandy land, or the very deep bottom soils on the margin of streams—are exempt from this injury, partly by reason of their natural drainage, but chiefly because their soil texture exempts them. The texture of soil, of course, depends greatly upon the presence or absence of superabundant moisture. Prairie and level clay lands are especially subject to alternate upheaval and settling by the action of frost. Winter and spring sometimes give place to summer with so little of violent alternations of frost, and with such an absence of superabundant moisture, that lands liable to spring killing are so far exempt as to yield abundant wheat harvests.

The object of this article is briefly to show that skilful cultivation may, for the time being, so change the texture of such uncertain soils as to make them, in this respect, as sure as the best wheat soils.

First of the prairie, for that is somewhat the key to the whole. In the year 1824, I first beheld the prairie. The pioneer settlers were then, with huge wooden ploughs, drawn by four stout yoke of oxen, breaking up the virgin prairie sward. The furrow slices, which were eight or ten inches thick, and very wide, resembled, in consistence, hugh oak planks, so unyielding were they to the tread of man or beast. A day's harrowing was given to each acre to fit it for seed. Sometimes a light, sharp ax was used in place of a hoe in planting corn. Now, while it was said that it would be better to throw away winter wheat than to sow it on subdued prairie soil, yet on these furrow slices winter wheat was grown with absolute certainty, so far as any upheaval of the soil or spring killing are concerned. Large crops were not obtained, but very uniformly from ten to fifteen bushels per acre were harvested. The texture of the rotting sward, for the time being, bade defiance to the sudden transitions of freezing and thawing.

Now about level clay lands. When the completion of the Erie canal, and the consequent unlimited demand for wheat, in cash, at very remunerative prices, gave a great impetus to wheat growing in Northern Ohio. the owners of vast tracts of beech and maple clay lands attempted to grow that cereal on a large scale. In some seasons they were successful, and in other seasons—because of spring killing—they failed. One farmer, even in these unfavorable seasons, always had good wheat. Sometimes his wheat field, like an oasis in a desert, was in striking contrast with surrounding desolation. His success was due to an artificial change of the texture of his soil. It was the prairie exemption over again. He selected for wheat a tough timothy sward, which in the season of trial, was dead but not entirely rotten. Thereby his soil was made to resemble, in texture, soils which are naturally exempt from spring killing.

There are prairie farmers, at the present time, who very uniformly raise from twenty-five to thirty bushels of wheat from old prairie soil. One method is this:—The field is first drained. In some cases tiled. In other cases plowed in narrow ridge lands, with outlets for surface drainage. Then the plowed and harrowed surface is treated to a slight sprinkling of rotten barnyard compost; then rolled. Then the seed wheat is drilled in. Afterwards the field is undisturbed. The man who invented and practiced this method often accomplished what his neighbors previously considered impossible.

Wheat is very sensitive of a superabundance of moisture. Land must be dry either by natural or artificial drainage, or else success in wheat-growing is a very exceptional case, and the exception is very rare indeed.

Plows and Plowing.

Some of the facts connected with the history of the plow seem hardly credible at the present time. The forked branch of a tree was used by our Saxon forefathers in England to do their plowing with. As late as the year 1740 there was a custom prevalent in the remote west of Ireland of attaching the rude plow to the horse's tail. This necessitated the work of two men, one to hold the plow and the other to walk backwards before the poor animal to guide it by striking it on either side of the head. Strange as it may appear, this custom was only stopped by an Act of Parliament being passed, making it a criminal offence to attach an animal to a plow in the above singular manner.

We find the same custom was mentioned as being used in part of that country as late as the year 1792. In an article on agriculture, in the *Encyclopedia Britannica*, published about the year 1822, we find that the most approved plows of those days were constructed of wood, with a covering of sheet iron on the working parts; and that the prize plow at one of the agricultural shows in the north of England had a beam ten feet long, and required the united work of six oxen and two horses to draw it, and then not work the ground any deeper thon two good horses and one of our modern plows do at present.

At the Centennial a large variety of plows were exhibited, not only from America, but also from European countries. The long-handled Scotch plow, from which pattern nearly all of ours are constructed; the American plow, with long beam and handles nea ly straight up, so that if you take a long step you will strike your toes against the mould board; the Russian, very heavy and awkward looking; and the Swedish plow, which is nearer in resemblance to ours than any other I saw there.

The first successful steam plow was invented about the year 1856, by Mr. Fowler, of Leeds, England, and the enterprising firm of J. & F. Howard, of Bedford, soon followed in his wake with their patent, and carried on a successful competition for the public patronage. But steam plowing will be a long time coming into general use in Canada, as the cost alone (being about £1,000 sterling) is far too great for the large majority of farmers, and there are yet too many impediments in our farms in the shape of stones, stumps and trees for a steam plow to work. In the course of time it may be used to a limited extent, but this generation will have to look to the horse as the best means of tilling the soil. I mention two very useful attachments which are coming into general use, viz.: the Skimmer, as it is called, for turning sod, stubble or manure to the bottom of the furrow, and leaving a clean, mellow soil on top; and the Adjustable Heel, lately patented for regulating the depth of the point when it becomes worn in hard dry soil. We have now to consider the relative value of deep and shallow, and fall and spring plowing, and I hope that my remarks will be fully criticized, and, if wrong, be put right by older and more experienced farmers.

Mr. Alderman Mechi, of Tiptree Hall, Essex, England, one of the ablest experimenters on agriculture of the present day, is decidedly in favor of deep cultivation. He uses at certain times, two plows in the same furrow, the subsoil one drawn by four heavy horses, and he says thereby gets rid of a great many weeds especially of thistles, which by ordinary plowing are only cut off seven or eight inches under ground and soon force themselves again to the surface. It stands to reason that if the root of a plant is cut off twelve inches under ground it cannot come to the surface as soon, or have the same time to produce its seed, as one cut off only half the depth. Deep plowing also acts in part as underdraining by loosening the soil and deepening the water level or hard pan and gives the roots of plants a greater distance to descend before striking stagnant water, so prejudicial to all growing crops, therefore on clay lands or low bottoms the deeper we can loosen the soil the better. Plants will send their fine fibrous roots wherever the can find nourishment, and if the soil is enriched and soft for a depth of ten or twelve inches it is easily seen that it must yield more food for the growing plants than a soil of only six inches deep. In a parsnip bed was an old well that had been filled up with debris of all kinds. On this part, the plants were very large, and the gardener had curiosity enough to see how long one of the largest was, and he dug eleven feet before he reached the end of the small roots of the plant. I myself pulled up a parsnip in our garden that grew where I had taken out an old root the year before, that measured five and a half feet to the end of the longest root, and I have no doubt but some of it was left in the ground. Again on clay or bottom lands the subsoil itself contains valuable elements of fertility, and by merely stirring this soil instead of turning it up, we give a chance for the roots to penetrate and appropriate this food to themselves. A good many farmers misunderstand the way and the use of deep cultivation. Anyone of ordinary intelligence must know that if he turns up three or four inches of cold sour subsoil, and then sows his seed he will get a very slim crop, if he gets any. The right time to plow deep in this country, is in the fall, and leave the ground rough all winter, the cold sour earth thus thrown up is exposed to the influence of the frost and snow, and being hungry absorbs large quantities of Ammonia and Nitrogen from the air, snow and rain. Then follow this plowing with summer fallow. Plow the second time in June or July only about half the depth of the fall furrow, then by plowing the seed furrow the same depth as the first, we turn back the previous top soil with the weeds, sod or stubble thoroughly decayed and the previous subsoil turned below again, enriched by natural and artificial manures, and we hereby form a deeper and richer soil for the roots of succeeding crops.

A gentleman had a field of black sand somewhat similar to our river flats plowed about twice the depth of former plowings, the succeeding crop was almost a failure, but after two or three plowings the benefit began to show itself, the land seemed entirely renovated and produced unprecedented crops. The general advice of nearly all old and successful farmers is to plow deep. From my own experience I am convinced that on heavy clays or low lands deep cultivation is extremely beneficial, while on light sandy or graveely soil, just the reverse is the case. On the last mentioned soils we should enrich the surface, then by the law of gravitation the manure is washed to the roots of the growing plants and appropriated by them. The safest way on these light lands is to keep what soil you have in a good state of fertility by applying manures *on* or *near* the surface such land does not need draining and the subsoil is loose enough for the roots to penetrate, if there is anything there that they can use for food. Every farmer must be his own judge, and plow according to the nature of the soil he works, but give me deep cultivation on my heavy land and shallow on my sand and gravel.

Abridged from a paper read by Brother T. A. Good, before the Brantford Division Grange.

Alsike Clover.

A correspondent of the Manchester *Enterprise* writes:—

"S. B. Palmer, of the town of Manchester, has threshed 18 bushels of beautiful, clean Alsike clover seed from 4¼ acres of land (a gravelly loam). In the spring of 1870 he sowed about five pounds of Alsike seed to the acre, and in 1871 he cut it for the seed. In 1872, like other clover, it was partially killed by the winter. In 1873 he mowed for hay what was left alive, and in 1874 he used the land for pasture. In 1875 he plowed it seven inches deep and raised a crop of corn. In 1876 he plowed and sowed with oats, and the Alsike came up finely without seeding. In 1877 he mowed, stacked and obtained the above amount of seed, besides the hay. Alsike makes the best of pasture or hay, and four pounds of seed are sufficient per acre. I think it is as hardy as old clover. I have found it a success on reclaimed marsh land. It is claimed to be the best of honey-producing clover."