

in need of being drained. Without draining they cannot be profitably tilled and cropped. They are cold, and hard to work; they are always late in condition for spring culture and late in maturing their crops. In the most favorable season the tiller of such a soil is seldom or never repaid for his labour till these adverse circumstances be removed, and this can only be done by thorough draining. In such soil drainage has been well said to be the foundation of farming. And when drained this heavy soil has its peculiar advantages. It yields a greater produce of wheat, and of a better quality, weighing more pounds to the bushel than lighter soils.

When water is stagnant on the land or in the soil, instead of percolating through it, plants will not extend their rootlets into the cold hard clay, and must obtain their food from a shallow surface soil beneath this is so impervious to air and heat, the necessary aids to germination and continued growth, that a light hungry crop is sure to be the result.

The cost of under draining is a very important consideration. It is impossible to state any definite amount, as the expense varies with various circumstances, as the quality of the ground through which the drains are to be cut, the depth that it may be necessary to cut them, and their distance apart. So much is the expense of draining dependent on these various circumstances, that they differ not less than one hundred per cent., the lowest from the highest scale of charges.

In no other country has the science of draining been more thoroughly studied and reduced to practice than in Great Britain. A very large sum was appropriated by the Imperial Legislature, as a fund for loans, to be lent to landed proprietors for the purpose of underdraining. The drainage under that act has been more thorough than any yet carried out in America, and at probably a greater cost, though the wages in England are lower. The cost there per acre has been from \$20 to nearly \$45, the labourers earning 75 cents per day at draining. It has been said that a fair figure for underdraining ordinary land in Canada would be about \$10 to \$12 per acre. It may in some cases be enough, at least for temporary purposes, to expend in draining \$10 to \$12 per acre over the whole farm, some fields needing comparatively little draining; so that a sum of \$1,000 or \$1,200 would pay for all the draining immediately necessary on a one hundred acre farm; but land needing it cannot be thoroughly underdrained under \$25 per acre, and some, for a much higher figure. We speak from experience, and our observations are confirmed by the experience of many practical men. In the *Country Gentleman*, of the 21st instant, W. L. Chamberlain, relating his experience in draining on his farm, states the cost to be \$25 per acre. Where circumstances are favorable this amount may suffice, but in such land as most needs draining, where soil is very stiff and heavy the drains must not be too far apart, and by this, and the greater depth of the drains where necessary, the expense of underdraining is greatly increased. A farmer cannot invest his money better than in draining, if his farm needs it. The increased produce of his crops, will, in a very few years, repay him what he has expended.

#### Parsnips as a Field Crop.

The uncertainty that attends the growth of any root crop makes it the more necessary that we do not limit ourselves to any one or two varieties. The improvement in agriculture in England within the last half century has been brought about in a great measure by the introduction of the turnip and turnip rotation into the farming of the country. But the turnip crop has become very uncertain. The turnip fly and the frequent failures of

the germination of seed have caused many great disappointments. The turnip is still sown for winter feeding, but not to such an extent as in times past. The mangold now disputes the place of pre-eminence with the turnip; kohlrabi is also extensively grown, and the carrot and parsnip are coming into more general use. It is good policy to grow more than one variety, to be prepared for a possible failure in that one. The value of parsnips for stock feeding has been underestimated, though its value as a garden vegetable has long been well known. The culture of it has for some time been extending in France and Belgium, and it has been coming more into favor with English farmers. There is no root superior to the parsnip for feeding milch cows; fed on it they give a very large yield of milk having a rich color, and affording butter of excellent quality. Steers and hogs are fattened on parsnips in a very short time, and there are no other roots that produce meat of superior flavor to that fed on parsnips.

The best soil for parsnips is a rich, strong loam. It should be well manured and plowed deep towards the end of autumn, and remain during the winter in the rough ridges to receive all the mellowing influences of the frost and snow. As early in spring as the ground is dry enough for working it should be rolled and then drilled in drills fifteen to eighteen inches apart. Five or six pounds of seed per acre is required. The hollow-crowned Jersey is the best variety grown. We have cultivated it for several years, and we have found no other variety equal to it in quality or approaching it in yield. The seed is slow of germination, taking about six weeks for the young plants to make a good appearance. Hoe and keep free from weeds, as any other crop; thin from six to eight inches; they require more space than carrots.

The yield of parsnips is seldom so heavy as that of the Belgian carrot, the turnip or mangold, about ten tons per acre being a fair crop; but its superior quality for feeding, especially for milch cows, should cause its culture to be more extensive than it is in this country. To this is to be added the diminution of the risk of a failure in other root crops.

The leaves, when the parsnips are fully grown and matured, may be fed to cattle, always taking care that they are sufficiently wilted by cutting them off the roots twenty-four hours before being used. The roots, when taken up, may be safely stored during the winter for spring use in pits, or, if convenient, in a root house; or they may be left in the ground throughout the winter, and dug out as required. Frost, so far from injuring them, seems to improve them for feeding. This too is a point in their favor.

Though the preparation of the land in the autumn, as above stated, is to be preferred, still large crops may be grown by culture in the spring only. Autumn or fall manuring for root crops in general has great advantages. The soil can be brought into better tilth, made more mellow and friable and with less labor than if the plowing be deferred till spring; and it is a forwarding of the spring work, which is a very important matter. However, when suitable soil is available and can be brought into good state of tilth in spring, we may have quite as good a yield as if the ground had been autumn fallowed.

We have a report from an English farmer of his profits from one acre of turnips fed to hogs and milch cows. He states that he realized a profit of over £21. This was but one instance. It shows what may be done, and we can have no judgment on a single instance. He says: "I must observe that giving my dairy cows the parsnips answered my purpose greatly by increasing their milk and making the butter much richer than turnips or carrots which I had given them long before. The manner in which I gave the parsnips was by cutting them in pieces."

#### A Subject for the Consideration of Canadian Stock-Feeders.

Can Canadian farmers realize a profit from feeding cattle for the British markets? This is a very important query, and worthy our serious consideration. Beef, to bring in England prices remunerative to the feeder and shipper, must be of first quality, and when it is so it commands high prices; but feeders must bear in mind that good prices are only to be had for really prime beef. American store cattle are now being shipped to the continent of Europe, to be fed there for the English market. A company of German farmers have sent agents to America to inspect cattle and inquire into the particulars of the trade in American live stock. Believing the state of the trade to be favorable to buyers, they have sent a dispatch to Europe advising that one of the steamers of the Tanning and London S. S. Company be fitted up and sent to New York, to await there the arrival of a cargo of young steers.

The company are extensively engaged in the supplying of fat-cattle to the English market. They are wealthy farmers of Schleswig-Holstein, and they own a number of steamers which have been used for carrying live stock to England; and they now are about importing from America store cattle, such as they expect will repay them the expenses attending the importation, besides a profit for their feeding. The stock they require are well bred young steers, averaging 1,100 to 1,200 lbs., and such as will readily take on flesh, so as to reimburse the feeders for expenses and risks incurred. The pioneer steamship of the trade is to be fitted up especially for the easy transportation of the cattle, and its capacity is such as to enable it to carry from four hundred to four hundred and fifty each trip, together with the necessary provender.

Now, if the buying store cattle in America, the transporting them to Germany, and the feeding them there for the English market, will bring a profit sufficient to remunerate those engaged in the enterprise, we may reasonably expect a profit to the feeders for fattening cattle in Canada for the same market. The food for fattening can be grown at as little cost here as in the European continent, and the same market is as free to us as it is to them. The objection of the distance of transportation holds equally strong against German as against Canadian feeders. We have to ship our fat cattle across the Atlantic to market. They are about shipping store cattle across the Atlantic to be fed in Germany and then shipped to England.

The great demand in England for imported meat may be conceived from the fact that not less than sixty steamers owned in Germany find employment in the carrying of live stock to British ports. This is but one item, though a very important one, of this ever increasing trade. The Americans are expecting that this demand for store cattle is but the beginning of a large trade; and look forward to an active demand for their live stock. We would not advise our farmers to dispose of store cattle, but rather to aid in the supply of British markets with prime beef and mutton; and we would again impress upon them the necessity of feeding high-bred stock and feeding well, if they are to compete for the high prices paid for choice meat in the markets of Great Britain.

#### Work for the Professors of Agricultural Colleges.

In an article on the Clawson Wheat, the examination of wheats by Dr. Kedzie, of the Michigan Agricultural College urges the Board of Agriculture to undertake and carry out such investigations as that of Dr. Kedzie, and no longer confine their labours to paltry trials and experiments already made known by the labours of English,