GARDEN AND ORCHARD.

THE FRUIT GARDEN.

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"What soil, and what conditions of the surface soil would best conduce to the proper development of apple trees?"

While the apple tree is being so generally and often so successfully cultivated throughout the country, it seems unnecessary to give any minute description of a suitable soil for that purpose. The general intelligence of our people has led to the establishment of the idea that land, which will produce a good crop of wheat or barley, ought to be suitable for an orchard, and in this they are mainly correct, as the cause of failure is not so much in the kind of soil selected as in the lack of knowledge as to the preparation and after-treatment of the surface soil.

A large portion of the surface soil in Ontario is of a clayey formation, and is usually described as clay, clay loam, sandy loam, loamy clay, etc., but which may be described generally as calcareous clay, with a greater or less quantity of humus or vegetable admixture.

The fertility of such a soil depends largely on its physical properties, perhaps more so than on the chemical combination of its elements. In its natural state, where clay predominates—and it generally does with us—its power of cohesion is so great that it will not readily permit water to percolate through it; it has but little power to absorb moisture by capillary attraction, to absorb gases, or to retain heat. The physical properties of this soil must, therefore, be materially changed before apple trees can make such healthy and vigorous growth as to make their cultivation remunerative.

The conditions of the soil which seem to offer the best promise of success are: first, that it shall contain the necessary combination of chemical elements, and then that the surface soil should, by mechanical means, be made incohesive, permeable, friable and mellow, to the depth of eighteen inches or two feet, and that it should be dark coloured, and also that ample provision be made by under-draining or otherwise, for the percolation and carrying off of all superfluous water, then it will readily appropriate from the atmosphere the three great desiderates of vegetable growth, air, heat and moisture. Trees planted in such a soil will have ample room for the ramification of their roots for a very long period of time, and if the soil, by mechanical means, is kept in the state indicated for eight or ten years after planting, the trees will not decay through loss of a large portion of their lower roots, by rotting in stagnant water, as is frequently the case in undrained soil.

In the spring of the year the season of growth will commence much earlier in land so prepared. The under-drains will have carried off all superfluous water early, and, therefore, its warmth will not be lessened by evaporation from the surface. On the contrary, it will be enabled to absorb and *digest* the warm spring rains and the sun's rays from two to three weeks earlier than soils left in a state of nature, or if only cultivated to the depth of a few inches. As a proof of how readily a suitably prepared soil will absorb moisture even in the early spring, I may mention that, on the 26th of April, 1880, between four and five o'clock in the afternoon, and while the thermometer stood at about 60° Fah., rain fell to the depth of twenty-nine inches, which will be about thirty-two tons of water to the acre; every drop of this, which fell on a portion of my garden that had been, for some years, in a high state of cultivation, was entirely absorbed, while uncultivated land, but a few rods distant, did not absorb any perceptible portion. Here then, was a large quantity of water, heated by its passage through the atmosphere to nearly 60° Fah., passing quickly into the soil, taking with it a portion of the soluble part of the manure which had been liberally applied to its surface, thereby assisting greatly to raise the temperature of the soil to the point at which the germination of seeds and growth of rootlets commences; namely, to about 58° Fah., The next day this piece of land was sufficiently dry for working.

Colour too has much to do with the temperature of the soil, and it is easily shown that a dark soil will absorb heat and retain it much better than a light one. If two flower pots of equal size and quality, but one white and the other black, be filled with dry, calcareous clay, taken from some cool place and exposed to the rays of the sun, it will be found that the temperature of the soil in the white pot will not increase more than sixteen degrees, while that in the black one will increase twenty-four degrees. Therefore, if the surface soil is too light in colour, it should be darkened, and this can readily be done by applying a sufficient quantity of barn-yard manure, but where such an application is not desirable, as in a young orchard, probably swamp muck might answer a better purpose.

Well cultivated and thoroughly under-drained soil will withstand our occasionally severe summer droughts much better than soil not so prepared. Perhaps it may not be generally known that a very large proportion of the moisture necessary for the support of vegetation, during the season of growth, is obtained from the subsoil. Many proofs may be given in support of this theory. One of the most obvious is the numberless springs which abound throughout the Province, at points much higher than the general level of the surrounding neighbourhood. Another proof is the fact—which may not be quite so obvious, although more satisfactory, when obtained—that, after a few days' heavy rain, subsequent to a long season of drought, water, or the subsoil saturated with water, can often be found in undrained land at a depth of two or three feet below the surface; while the rain water which had lately fallen had not penetrated the soil more than eight or ten inches. The intermediate stratum being absolutely dry, and this in places where, had an examination been made before the rain fell, the subsoil, to the depth indicated, would have shown no sign of moisture. If a supply was not obtained from this source, many of our own trees and most of our agricultural crops would have been utterly ruined during the prolonged draught of the last summer. As it is I am afraid much permanent injury may result to fruit trees in undrained soil from this cause. The tiny rootlets penetrate the earth in search of the retreating moisture during a dry season, to a much greater depth than during a wet one. When heavy rains set in, the subsoil becomes unduly saturated, and the rootlets, not having the power to retrace their steps, must of necessity remain buried in the cold, wet subsoil until late in the following summer, and before that time the roots become diseased by cold, excessive moisture, and the lack of the needed stimulants of heat, air and other gases. The poison is absorbed into the tree in early spring, generally causing permanent injury, often proving fatal to the tree.

Ten acres of land planted with healthy, well-grown apple and other trees, carefully set in rich, loamy soil, overlying a calcareous gravelly clay (such as largely predominates throughout this Province), properly subsoiled to the depth of two feet, thoroughly under-drained by drains at least four feet deep, and carefully cultivated every year for seven or eight years, by growing potatoes and mangolds or other root crops will, in my opinion, from that time forth, prove to be a more profitable permanent investment than can possibly be realized from fifty acres of land devoted to any agricultural purpose whatever.

WINTERING CELERY.

Of all the crops of the garden, that of celery is the most uncertain, the most laborious and most expensive to raise. It is more than these: it is the most difficult to keep in a good, sound condition through the winter and to the middle of April at least as it ought to be, to compensate the producer fully. We profess to have had a good deal of experience with the celery crop, and we have usually as successful a yield as is to be found in any well-managed garden.

In storing the crop for the winter, we have usually pursued two modes which have answered well. The first is to remove the celery to high and dry ground, dig a straight trench spade deep, stand up a row of plants singly, then another row, with some earth between, and so on until about half a dozen rows are finished, when commence another bed, and so on. The soil should be packed in firmly and then banked up, so that the tops of the celery are just covered, then spank off roof fashion to turn the rain. Over this two wide boards, nailed together, should be placed as a security against moisture, or straw can be bent over and secured at the bottom with bean poles, and a little gutter to carry off the water at each side. Celery put away thus carefully ought to keep till May.

Another plan is to sink barrels into the earth so that the tops are two or three inches below the surface, then stand them compactly full of celery without any soil; put tight covers upon them, so as to exclude all moisture, and then a couple of inches of soil.

For early consumption—that is to say in December or January—it can be preserved in rows where it is grown, properly covered and protected against moisture.

SEASONABLE PARAGRAPHS.

A BLANKET of good manure during the winter will start rhubard off lively in the spring.

IN shipping apples in winter line the barrels well with newspapers and they will stand a greater degree of cold without injury.

BURY hard cabbage heads down. Stand the soft heads on their feet in the trenches, and they will likely harden up before spring.

WHEN the temperature of the fruit cellar is likely to run below 32° set therein a big coal oil lamp, or a bucketful of boiling water.

A TREE that is covered with scale lice is unhealthy, and its restoration to health by proper cultivation, manuring and draining, will remove the cause of the lice.

IN buying trees from the nursery inspect closely the roots. No matter if the stem be crooked and the top sprawley. If the roots be right the other end will come right.

OF the two or three thousand varieties of apples, four or five are enough for any one orchard (for market), and those should be the ones which have proved themselves the best in ones own neighbourhood.

IN selecting fruit trees or any others, be careful to choose those with smooth, healthy-looking bark, which have entirely shed their leaves and have plenty of small fibrous roots. Trees on which the leaves remain after frost sets in, and stick to the branches in the spring, may be regarded as not healthy, and some way lacking stamina.