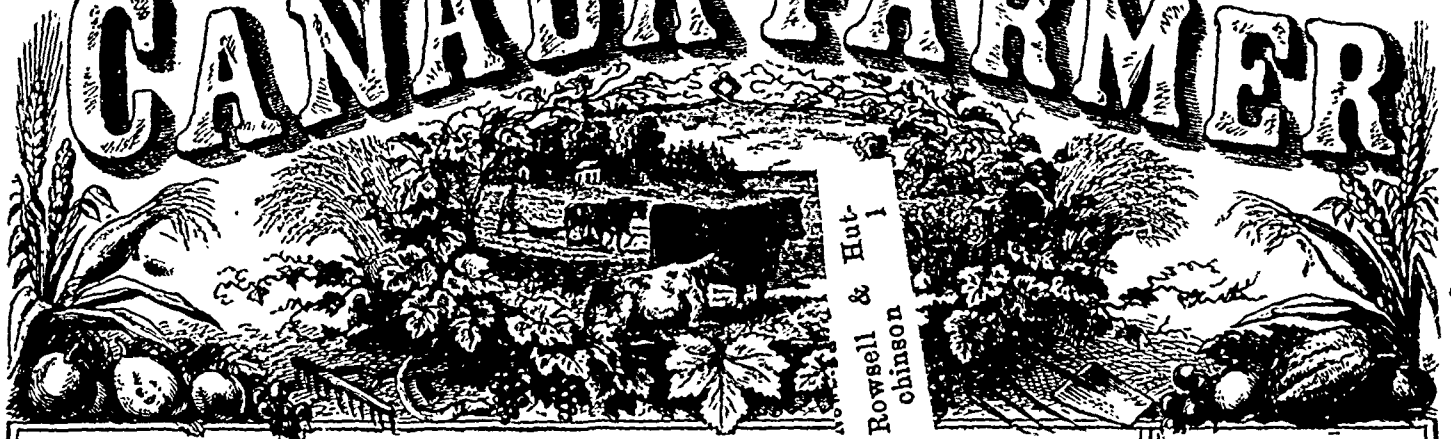


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The Field.

On the Retention of Moisture in Soils.

Every one knows that water, in some form or other, plays a most important part in the general economy of nature; and its influence on the soil, and consequently on the growth and maturity of crops, is deserving of the closest attention of the intelligent and improving agriculturist. It is now generally acknowledged as an established fact that the wholesale clearing of our forests, and the denuding cleared farms, in too many instances, of almost everything in the shape of a tree, have already produced a sensible change of climate, and contributed, in conjunction with other causes, to render summer droughts more frequent than formerly, and to intensify their injurious effects on the cultivated crops. How to mitigate, therefore, the effects of this evil, should be the earnest study of the Canadian farmer.

Without water, in some of its varied conditions, the animal and vegetable life of the globe must cease to exist. Whether in excess or deficiency, it is alike injurious to the labours of the agriculturist, who, to correct the former, must have recourse to artificial draining, and to counteract the natural effects of the latter he must adopt such a course of cultivation and manuring as will enable the soil to retain an amount of moisture sufficient for the healthy growth and maturity of plants. The first and most necessary step, in the generality of soils, towards the retention of moisture, is to obtain a deep stratum of well cultivated and porous earth. It will be no less useful than curious to examine a little into the relation that subsists between drainage and deep culture.

All land having a heavy and retentive subsoil, is usually found to be more or less wet and cold, conditions very unfavourable to efficient tillage and the healthy growth of crops. Such soils suffer most either in a dry or a wet season, and they are pro-

verbially known, in all parts of the world, as the most expensive to cultivate, the most difficult to manage, and most uncertain in results. The first essential step to be taken for the permanent improvement of such soils is unquestionably *efficient draining*. It may appear at first sight paradoxical to speak of draining land with a view, among other important advantages, of increasing its capacity for absorbing and retaining moisture—an *apparent* anomaly merely, that will readily disappear when the various effects which draining produces on wet land are duly considered. Indeed, a well executed system of underdraining, while it necessarily relieves land of an injurious excess of water in wet weather, enables it to procure and retain moisture during a season of drought. By relieving land of superfluous water in this manner, its numerous pores become filled with air, which always holds the largest amount of vapour in a state of invisible suspension during hot weather, and this air circulating through the pores of the soil, reaching, especially in the night, colder substances, imparts a portion of its moisture, exactly on the same principle as dew is deposited on plants growing on the surface. Any one may readily verify this by observation. It is invariably found in dry seasons (assuming other conditions to be equal) that the crops, whether grass, roots or grains, that grow on or close to an underdrain, are greener and more luxuriant than those at a distance; and a similar result will be observed in wet seasons, unless the whole field has been thoroughly drained and cultivated.

Now, we learn from observing the functions and effects of a well constructed underdrain, two most important principles, which form the very basis of an improved agriculture. First the incalculable advantages of relieving cold, stiff and wet land, of an injurious excess of water, without which no system of cultivation and manuring can be successful; and secondly, the benefits of *deep culture*, which, affording a thick stratum of active, porous soil, through which both water and air can freely circulate, and the

roots of plants as freely extend in search of food, securing a warmer and more uniform temperature, and other conditions both of a mechanical and chemical character, that are favourable in the highest degree to the growth and maturity of crops. The reader, by pondering on the principles involved in these few facts, will not be at a loss to discover the right way to pursue in order to gather the legitimate harvests of all sound and profitable agricultural improvements.

Deep and shallow, as applied to cultivation, are words that must always be understood in a comparative sense. Deep culture in some places and on soils of a special character, would in others, comprising different conditions, be regarded as shallow; hence no absolutely defined rule can be laid down in matters of this kind, that can meet the many varying conditions which exist in nature. The tendency, however, of improved husbandry, is towards deeper cultivation, a process which, in the generality of cases, it is both easier and more advantageous to carry on by degrees, rather than attempt to obtain the final object, or maximum of depth, by one or two operations. In all cases of wet soils, as has been already intimated, draining should *precede*, by a season or two, deeper cultivation; otherwise, in many cases, the latter might prove positively injurious, by producing a thicker stratum of soft, muddy earth, wholly unfit for a seed bed, and taking a long time for the water to pass off, chiefly by the slow process of evaporation. Most wet and stiff soils rest on, in moderate weather, a comparatively hard and dry subsoil, varying in depth from the surface three or four inches to upwards of a foot. Now, it is this hard pan that requires to be broken and pulverized, in order to deepen the active soil through which air and moisture can freely circulate, thereby affording the roots of plants a wider extension in search of food. The cheapest and readiest way of accomplishing this desirable object, where horse power only is available, is to follow the furrow made by an ordinary plough by the subsoil plough, say six or eight inches by the