

become so dense upon the surface that air is too much excluded, and prairie soils are so light that unless the surface is stirred just a little on the top now and then they lose their moisture. They are also noted for the innumerable weeds which they produce. All this may seem very nicely woven theory to those who believe only that the thing which hath been is that which shall be, but it is our conviction that this matter will eventually receive that measure of attention which its importance deserves.

Moisture in the Soil.

In the season of growth it is very essential that the plants have a reasonable amount of moisture if we are to have good crops. How to supply them with moisture should be carefully studied by the husbandman, and it should be his aim, more especially in dry seasons, to so order the processes of cultivation that the plants may have a constant supply of moisture, so far as it is in his power to furnish the same.

Some soils have much more power than others to retain moisture which falls upon them, and also to draw up supplies of moisture from below. Clay soils have much more power than sandy in both of these respects. Hence it is that clay soils ordinarily suffer much less than sandy in time of drought. And hence it is, also, that when the surface of clay soils is frequently stirred they retain the ground moisture better than sandy soils.

There is a constant upward movement of moisture in the soil. This arises from that power in water which enables it to rise under certain conditions, on the principle of what is known as capillary attraction. It climbs up through the little interstices, or air spaces, in the soil, that is, between the particles of the same, and the smaller the air spaces the more easily does it climb. In clay soils, therefore, the ground moisture comes up to the surface much more readily than in sandy soils. In the latter, the spaces are so wide between the particles that the water cannot readily ascend, but it does ascend to some extent. Now, if some means are not adopted to prevent it, the ground moisture will come right up to the surface of the earth, and will escape into the atmosphere. The aim should be to try to arrest it as much as possible, and thus prevent its escape. It will then be taken up by the roots of the plants.

Several methods of doing this may be adopted, which are more or less practicable according to conditions. The most common of these is to stir the surface of the ground as frequently as possible

during the season of growth. With grain crops this cannot ordinarily be done, but if it could be done without injuring the grain it would be beneficial to the crop. Because of this, it would be greatly beneficial to the crop if some form of cultivation could be given to grain crops, and more especially until these were far enough advanced to shade the ground, by which time they would help it to retain moisture, not only by hindering surface evaporation, but by changing the character of the surface soil as a mulch does. It has been observed by all who have tried it that when the surface of the ground is stirred often where a crop of corn or potatoes is growing, the growth of these crops is much promoted. Now, one of the principal reasons for the promotion of growth is found in the fact that the ground, in consequence of cultivation, has been able to hold much more moisture than it would have held had it not been so cultivated.

A second method of retaining moisture is by mulching. This process so changes the character of the surface soil that it holds the moisture. Those farmers in the far west who attempt to grow trees have found it necessary thus to use mulch. But mulching can only be done to a limited extent, because of the scarcity of materials. However, in this fact those who live in dry areas may get a pointer as to the best ways of applying coarse manure. It would seem to be good practice in those areas to apply much of it on pastures by simply spreading it over the surface of the ground.

A third mode, which is very effective, is to try to keep humus or vegetable matter in the soil. Because of this, we should try to plow under green crops to the greatest extent possible. The more fully we can do this the better we can succeed in retaining moisture.

Vegetable matter arrests moisture which falls from above, and holds it near the surface, and, like fine clays, it also holds that which comes up from below. The success or failure of a crop may, therefore, depend very considerably on the amount of vegetable matter in the soil. But in dry areas it would be easily possible to turn under so much vegetable matter, more especially in the dry form, that it would keep the land so open that it would soon be so dried by the atmosphere that plant life upon it would die. And in dry climates this danger has to be guarded against.

Coarse, leachy soils may be improved in texture by the application of fine clay, of wood ashes, plaster of Paris, marl, and salt. These substances fill up more or less the interstices between the particles of sand, and, moreover, some of them have much power to draw and to absorb moisture.