

instead of for decades, and it is to investigate these important points that you are now assembled.

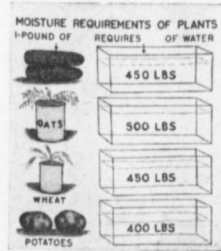
In presenting the study of the soil, and its fertility, I do not claim to have discovered any panacea for low yields, nor shall I attempt to elaborate any new discovery. The work which is herewith presented is a gathering together of current knowledge concerning the tillage of the soil and the management of plant food.

A PROPER PLANT HOME.

In order for largest crops to be produced, the home of the plant must be suitable. Much of the land of this whole continent is producing less per acre than it is able, on account of the lack of drainage. The Physics Department of this splendid institution has rendered invaluable service to this province, and in fact to North America, in its advocacy of increased tile drainage. Hundreds of acres in every county in this country are curtailed in their productiveness on account of surface water standing on the soil late in the spring and frequently throughout the growing season. These wet lands are slow in warming up in the spring; hence vegetation is slow in starting, which circumstances result in immature and deficient crops whose ripening season is cut short by early frost. The late Professor King of Wisconsin, over 15 years ago pointed out that in order to evaporate one pound of water from one square foot of soil surface, it required 956 heat units, and resulted in lowering the temperature of the soil over 10 degrees Fahrenheit. Hence, the bad results of standing water on our soils are twofold; first, such water as could be drained off fills the spaces between soil particles and shuts out the air; second, the surface water standing on

undrained soils reduces soil temperature as the water evaporates.

Plants must have water, however, since they are a type of creation that cannot take any but liquid food; that is, all plant food must dissolve in soil water or in root juices in order for it to be taken up so that it can be built into corn, oats, wheat, potatoes or other plant products. To give you an idea of the amount of water that is necessary to produce our normal crops, I direct your attention to the accompanying chart on "Water Requirements."



Water is stored in the soil by deep fall plowing and by turning under as much as possible of decaying plant matter or humus. Humus performs six great duties which are as follows:

(a). Organic matter or humus, which consists of decaying plant stalks, stubble, straw and the like, binds together sandy soils and gives them capacity to retain or hold water.

(b). Organic matter or humus gives the soil power to catch and hold soluble plantfood, which the plant is not prepared to take up.

(c). Organic matter acts like a sponge, giving the soil water-retaining capacity.

(d). Organic matter opens up heavy clay soils and allows circulation of air within them.