

that moisture can be retained for any length of time in the soil in dry weather, hence good drainage is an absolute necessity where moisture conservation is a matter of importance, just as it is an indispensable condition where seasons are short or rainfall very great in order to carry off the surplus water and allow air to enter the earth to reach plant roots and raise the soil temperature.

Ploughing and Cultivating as Methods of Controlling Soil Moisture.

Shallow ploughing and deep cultivation are, after drainage, probably the most important influences making for moisture conservation. Shallow ploughing by keeping the humus near the surface greatly increases the moisture holding power of that, the most important soil layer. Deep cultivation by stirring the lower stratum of soil helps disintegrate the stiff and probably waterlogged upper subsoil, and so very greatly increases the amount of capillary water readily available near the surface layer for crop requirements.

Surface Cultivation Conserves Moisture.

No matter what the condition of the surface soil and upper subsoil as influenced by ploughing and subsoil stirring, no matter how well drained the lower subsoil, if no precaution be taken to prevent evaporation, a very large amount of moisture is sure to be carried off from the surface by every faintest breeze and weakest sun ray. To prevent this, the maintenance of a soil mulch on such surfaces as are exposed to the moving air or direct sunshine is a necessary precaution. A soil mulch may be made by means of a light harrow. Sometimes, too, it may be made by a roller. The roller has usually just the opposite effect; under certain conditions, however, it is of value in this connection. To illustrate, it often happens that two or three weeks after seeding, before the grain is up high enough to protect the soil surface from winds and sunlight, a crust forms and moisture evaporation goes on apace. Going over such a field with a light roller breaks the crust and forms a soil mulch which effectually stops the loss.

Humus Conserves Moisture.

Humus absorbs and retains moisture much more readily than any other constituent of the soil. Hence one of the best methods of improving the moisture storing and moisture conserving powers of a soil is to increase its humus content. This may be done by the frequent turning under of sod and by the use of barnyard manure.

WARMTH.

For plants to grow rapidly, warmth as well as moisture is an absolutely necessary condition.

Drainage Warms Soils.

Drainage was shown to be probably the most important factor in making for moisture conservation. Drainage as an influence affecting soil temperature is of even greater importance. Undrained soils are always cool, usually too cold to favour plant