

Dry Farming in Western Canada

PREVIOUS to 60 years ago—lands having less than 20 inches of precipitation per year were generally considered unfit for crop production, except where artificially watered at great cost by irrigation ditches. Within the memory of men now living the practice of crop growing in semi-arid lands—those receiving between 10 and 20 inches of rainfall annually—has developed until at present much of the so-called dry land of earlier days is in many countries being successfully cropped as a result of the intelligent application of successful dry farming practices.

One quarter of the earth's surface receives less than 10 inches of precipitation annually, rather more than one quarter receives from 10 to 20 inches,

The Principles Governing Moisture Storage and Conservation—By Prof. John Bracken

there are vast differences in the loss by evaporation even in different parts of the Canadian prairies. It is possible that these differences are greater than are the differences in precipitation. The relative evaporation in different parts of Western Canada has not been studied scientifically, but the areas of extremes of evaporation can easily be located by a study of (1) the precipitation, (2) the productivity of crops, (3) the native vegetation in different parts of the west.

to result in increased yields or greater profit.

The factor that controls the yield on the poor soils of humid regions is plant food. On the soils of northern climates lack of heat or frost limits the yield of crops. On the dry soils of Western Canada the thing that limits the yield is moisture. The chief purpose of soil management in humid regions is to maintain or increase the supply of available plant food in the soil. In northern climates it is to hasten the maturity of crops; but in dry areas the chief function of soil management is to make the best possible use of all the moisture that falls. The first we may speak of as humid farming, the second as northern farming and the last as dry farming.

Dry Farming Principles

Moisture is required in large amounts by growing crops. In semi-arid climates the supply of moisture is small. Except on irrigated lands the only source of moisture is the clouds. The storage and conservation of as much as possible of this moisture in the soil, and its efficient use by growing crops constitute the foundation principles upon which dry farming is based. These principles of dry farming may be stated specifically as follows:—
(1) The storage of moisture in the soil.
(2) The conservation of the stored moisture, and
(3) The most efficient use of moisture so stored and conserved.

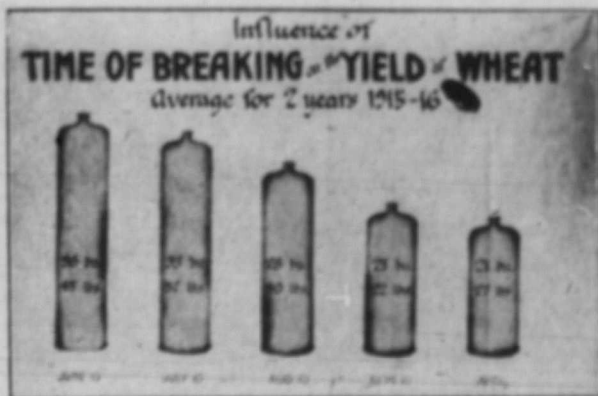
How to Store Moisture in the Soil

When moisture falls upon the land in the form of rain it is either absorbed by the soil or it finds its way to ditches, ravines or sloughs. The problem of storing moisture is chiefly one of preventing the "run-off" which occurs chiefly at two seasons, one during the heavy mid-summer rains and the other when the snow melts in the spring. The moisture will be taken in and the less

amount of "run-off" is determined by (1) the topography of the land; (2) the openness of the soil; (3) the depth of porous soil and (4) the kind of soil. The topography cannot be altered but some loss of water may be prevented by tillage crosswise of the main slopes. The more open the soil is the more will run away. The deeper the layers of porous soil the more moisture the land may absorb. The heavier the soil type the greater the run-off is likely to be.

The storage of moisture in "old" land is accomplished by:—

1. Following the land once in two, three, four or five years.
2. Plowing the fallow early or before the heavy rains come (generally in June) so as to prevent the "run-off."



Emphasizing the need of killing the native vegetation before it uses up the soil moisture in the process of growth. The yields in 1917 from the same dates of breaking were: June 10, 17 bus. 36 lbs.; July 20, 15 bus.; Aug. 10, 9 bus. 16 lbs.; Sept. 10, 5 bus. 37 lbs.; April, 1 bus. 15 lbs.

about one-fifth of the land area between 20 and 40 inches falls and on one-fifth between 40 and 80 inches, while the balance, about five per cent. of the total area, enjoys a precipitation of over 80 inches per year. The climate of Western Canada falls in the second class. Judged by the rainfall it is "semi-arid."

Net Available Moisture

But the precipitation is not a safe guide to the amount of moisture that may be made available to crops. The amount that evaporates differs widely in different climates. The precipitation is the gross supply, the precipitation less the evaporation may be said to be the net supply and it is the net available moisture that determines the aridity of a given area.

The northern end of the American prairies is more productive than those parts of the southern end that receives the same precipitation. Why? Because there is less moisture lost by evaporation here than further south. And

modified form or whether the practices of "northern farming" should not be followed.

What Dry Farming Is

Dry farming is a popular term that is used to designate the practices found to be desirable in areas of light rainfall. These specific practices, which together comprise the system of dry farming are not new but the organization of them and their intensive application within the last generation has resulted in giving to the system the special name "dry farming." The name is a misnomer in so far as any one may be led to think crops can grow without water. As a system of farming it has accomplished much in the semi-arid regions of North America, but even its most intelligent practice will not cause the desert to blossom. It can not accomplish impossibilities. The system is nothing more nor less than the use of common sense methods of meeting the rainfall conditions that exist by practices that have been shown



Showing advantage of early plowing and fall cultivation before fallowing. When not otherwise stated the land was surface cultivated before plowing, plowed June 10 and later cultivated enough to control weed growth. Results obtained at the College of Agriculture, Saskatoon.

3. Plowing the fallow deeply so as to increase its capacity for storing the heavy rains.
4. Loosening up clay soils so as to improve their water absorbing qualities.
5. Increasing the organic matter content of lighter soil types so as to increase the moisture holding power and decrease the loss of moisture by percolation.

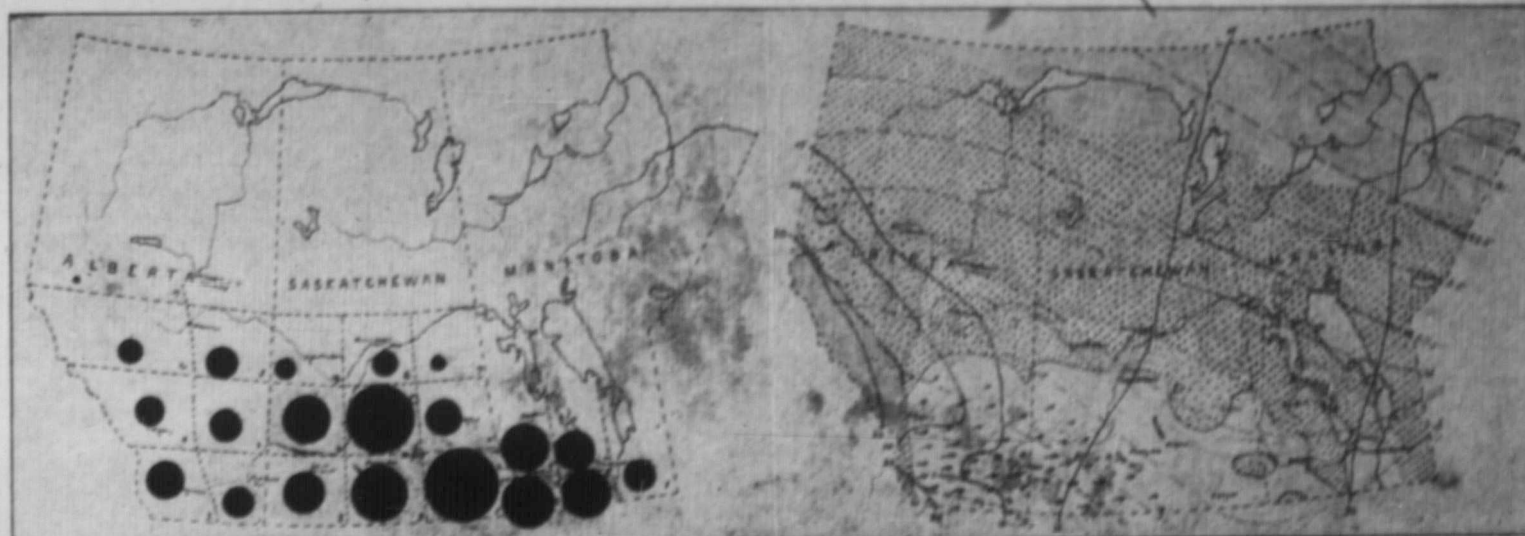
The storage of moisture in new or prairie land or sod land is accomplished by:—

1. Breaking and leaving idle for a year so as to kill the native growth and store the moisture it would otherwise use.
2. Breaking early so that the land may absorb all the rains of summer and not the late ones only.

The storage of moisture in stubble land is accomplished by:—

1. In some cases by leaving a long stubble to hold snow that on melting adds water to the soil.

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The cut on the left indicates where the Western Canadian Wheat Crop was grown in 1915. In the right-hand cut the arrows indicate the "Chinook" section of the prairie which is treeless. The dotted section indicates park belt, light shading, dotted, densely wooded. The heavy lines indicate the precipitation zones, and the heavy dotted lines, lines of equal temperature.