

mon to irrigated soils, and two possible causes therefor may be advanced. The first is the deposition of mineral salts from the irrigation water, and the second—probably the chief cause—is the bringing up of these compounds from the lower strata by increased capillarity induced by greater surface evaporation consequent upon irrigation.

It may be said that as southern Alberta is of the true prairie character, so northern Alberta is largely wooded, enjoying a more liberal rainfall and is naturally a country better adapted to mixed farming. The soils of northern Alberta are, for the most part, characterized by high percentages of organic matter and nitrogen, and in this respect are somewhat superior to those in the southern part of the province. We have in this a certain confirmation of the view that a relationship exists between rainfall and the organic content of the soil.

The samples so far considered from this province have been representative of areas in southern Alberta, the remaining examples are from points north of Calgary.

No. 6 is from Innisfail, an excellent district for dairying and mixed farming, some 80 miles north of Calgary on the Edmonton branch of the C. P. railway. This sample had been collected to a depth of 12 inches. As received, in the air-dried condition, it was a loose, crumbly, grayish-black, sandy loam, full of fibre and evidently rich in organic matter.

No. 7 is fairly representative of the soil on the recently acquired Dominion Experimental Farm at Lacouture, a point some 40 miles north of Innisfail. The country and soil in this neighbourhood are similar in character to those of the Innisfail district, just described, and indeed may be considered typical of a very large part of this northern portion of the province.

Nos. 8 and 9 are clay loams from Lac la Poudre, a district lying some 40 miles northwest of Edmonton. These loams are very similar, containing a large proportion of clay and well furnished with humus-forming material. They are of a grayish-black colour when air-dried. The chemical data well bear out the opinion formed from their inspection, and show that they are very rich in organic matter and nitrogen. The analysis also demonstrates that in potash and lime they are above the average and fairly well supplied in phosphoric acid. Under proper cultural operations and favourable climatic conditions, they should prove to be highly productive soils.

CONSERVATION OF SOIL MOISTURE.

It will be evident from the facts here brought forward that, while it is advisable to adopt such a system of farming as will lead to the maintenance of fertility, the necessity of returning plant food in manures and fertilizers will not be generally felt for some time to come, so rich is the soil of the prairies over very large areas. But while, as yet, nitrogen (or any other element of fertility) cannot be regarded as the limiting factor, the amount of soil moisture available during the growing season does most markedly affect the yield. We consequently find that the important question of prairie farming, and more particularly in these districts of sparse rainfall, is the conservation of moisture for the crops' needs.

Fallowing is the general means adopted to this end. This comprises the preparation by deep ploughing of a reservoir, so to speak, for the storage of the rainfall in the soil, and the formation by frequent cultivation of a dry earth mulch to check evaporation. To ascertain the extent to which water may be carried over by fallowing, from one season to another, a series of experiments was conducted some years ago on the Experimental Farms at Brandon and Indian Head, in which the amounts of moisture were determined to depths of 8 and 16 inches, respectively, on soils fallowed and cropped the previous season.* It was shown that at Brandon the soil which had been fallowed contained, during May, June and July—the months of growth—amounts of water varying from 330 to 65 tons, per acre, to a depth of 16 inches, over and above those in the soil that had borne a crop. Similarly, at Indian Head, the excess of moisture in the land that had been fallowed varied from 175 to 160 tons. While the amounts of moisture so conserved must depend upon the character of the season and the thoroughness with which the fallowing is carried out, the evidence fur-

* The data of this investigation will be found in the report of the Chemist, Dominion Experimental Farms.