

No. 12 is from an area in the eastern part of the third steppe, 281 miles west of Indian Head along the main line of the C.P.R., and not far from the boundary between Saskatchewan and Alberta.

The district from which this soil was taken enjoys, as a rule, but a very limited rainfall, and, previous to the adoption of special methods for the conservation of moisture, gave but scanty yields. It was thought by some that the poor crops were due to a deficiency in some important fertilizing constituent, or to the presence of "alkali" or other matter deleterious to plant growth. From this analysis it will be seen that there is no lack of plant food, though the percentages of organic matter and nitrogen are only about one-half of those found in the richer prairie soils. Absence of "alkali" was established and the conclusion reached that the meagre yields were due to insufficient moisture rather than to any inherent fault in the soils.

ALBERTAN SOILS.

No. 1. This soil, a black, sandy loam, was collected in the neighbourhood of Tilley, a point on the main line of the C. P. R. about 50 miles west of Medicine Hat, and a district that, owing to sparse rainfall, has hitherto been considered better adapted to ranching than to grain growing. As in the case of the two immediately preceding examples, this soil was supposed to be deficient in some particular, or to contain alkali. The data, however, show that there is an abundance of plant food present and an entire absence of alkali. It has been demonstrated in recent years in this and similar districts, through improved methods of culture (resulting in the better conservation of soil-moisture) that the poor yields were not due to the poverty of the soil, but rather to insufficient water supply for the needs of the crop.

No. 2, from the Dominion Experimental Farm at Lethbridge, an important centre in southern Alberta, a true prairie region, and where, until recently, ranching has been the chief branch of agriculture followed. It is a district in which, speaking broadly, irrigation is desirable, if not indeed necessary; but in which, in many seasons, fairly good yields can be obtained by the adoption of proper cultural methods for the conservation of soil moisture. The soil appears to be extremely uniform in character and very productive, provided there is a sufficiency of moisture.

The sample, which in this case was taken to a depth of 12 inches, is a dark gray, inclining to black, sandy loam, light and friable, free from stones and containing an abundance of root fibres. Though not as rich in organic matter and nitrogen as the majority of the prairie soils hitherto considered, the results are quite satisfactory, especially when the greater depth to which this sample was taken is considered.* In mineral constituents it seems to be fairly well supplied, the amounts being such as are possessed by many soils of high productivity.

No. 3 was collected from an uncultivated area on a bench in the valley of the Elbow River, some few miles from Calgary. The soil of the district is stated to be one "well fitted for either cultivation or grazing." It might be classed as a light to medium, black, prairie loam, especially rich in organic matter. It is practically neutral, and examination of the analytical data gives evidence that it is well supplied with all the essentials of plant growth, a very fair proportion of which appears to be in a condition immediately available.

Soils 4 and 5 were taken at no very great distance from the location of No. 3, and are in appearance very similar to it. They were examined to learn what effect irrigation might have on the stores of fertility. No. 4 is from a non-irrigated area, while No. 5 is from irrigated land, collected 50 feet from the lower side of an irrigation ditch, and 100 feet from No. 4.

Undoubtedly the feature of greatest interest in the comparison of the data is the decidedly higher percentages of soluble (available) mineral constituents in the soil that had been irrigated, and it is important to note in considering this fact that, while the non-irrigated land is neutral, that of the irrigated area is slightly alkaline. These features are not uncommon.

* In all instances, unless otherwise specified the soil collections were made to a depth of 9 inches.