

We may now proceed to some of the more important conclusions reached by us in our fertilizer investigational work during the past twenty-five years.

THE PRAIRIE PROVINCES.—Particular interest attaches itself to possibilities of increasing wheat production in Manitoba, Saskatchewan and Alberta by the use of fertilizers. A study of our results would not justify us in the prediction that this could be profitably brought about by a general application of fertilizer. For ten consecutive years, 1900-1909, we had a series of fertilizer experiments on the Experimental Farms at Brandon, Manitoba, and Indian Head, Saskatchewan. The series contained plots dressed with nitrogen, phosphoric acid and potash, singly and in combinations of twos and threes. The results, taking one year with another, failed to indicate any material increase in the yields of the fertilized over those of the unfertilized plots. Frequently the latter gave the larger crops, but it was seldom that the difference between the plots exceeded the amount that might be attributed to experimental error. Certainly there was no consistent increase due to any fertilizer and in no case was the increase sufficient to cover the cost of the fertilizer. These soils, it must be admitted, were typical wheat soils of high quality, but they were in no way exceptional. Hundreds of thousands of acres equally good are to be found in all three of the Prairie provinces.

Experiments carried on in northern Saskatchewan and northern Alberta likewise failed to indicate any specific deficiency in plant food in the soil, the results being irregular and the increases on the dressed plots (when such occurred) not being of that magnitude to warrant definite conclusions as to the virtue of the fertilizer employed or the expenditure for the purchase and application.

With respect to the future, my opinion is that the time will come when phosphates will be found useful. My reason is that of the three essential elements these western soils are least rich in phosphoric acid and that the extensive grain growing will tend to diminish the store of this element that is more or less available for crop use. Moreover, phosphates may be found of value in inducing an earlier ripening of the crop—a matter of much importance in districts where early autumnal frosts endanger the wheat crop. Our hope for these western provinces is that the abandonment of exclusive grain growing and the adoption of mixed farming and of rotations will serve to maintain fertility and obviate the necessity of relying generally on fertilizers for the up-keep of fertility. At the present time I feel assured that the determinative factors in crop production in these regions are the seasonal conditions. If our northwestern lands are not to be allowed to deteriorate, mixed