## FERTILIZERS

Fertilizers can be used only as supplemental to and not as a substitute for manure. There are three constituents, nitrogen, phosphoric acid and potash which may be present in compounded fertilizers; when all three elements are presented the material is termed a complete fertilizer. Experiment has lead to the conclusion that in the larger number of instances where a profit has been obtained it has resulted from the application of a complete fertilizer.

Domestic sources of potash other than manure:--

"Wood ashes are essentially a potassic fertilizer, ashes of good quality, that is, dry, unmixed with sand, etc., and unleached, containing between 4 per cent and 6½ per cent potash, the average potash content being about 5½ per cent. This potash is in a soluble form and hence immediately available for crop use.

"In addition to their potash they contain some 2 per cent phosphoric acid and from 20 to 30 per cent carbonate of lime, enhancing their fertilizing value and making them, in a sense, an all-round fertilizer for supplying the mineral elements required by crops. And, further, they correct acidity, a condition detrimental to the thrift of most farm crops.

"From 25 to 50 bushels of wood ashes per acre will furnish from 60 to 120 pounds of potash, the latter an ample dressing for even very light soils. They are not needed on heavy clay loams; indeed their use on such may destroy good tilth and do more harm than good. Their application is best deferred to spring, broad-casting preferably on a quiet damp day on the ploughed land, and incorporating in with a thorough harrowing.

"For clover, corn and mangels, they will be found very valuable. Especially are they beneficial for orchards and for grapes on sandy loams. For turnips, mixed with one-third to one-half their weight of bone meal, superphosphate or base slag, they have similarly proved advotageous. But indeed there are few crops on light and gravelly soils, as also on vegetable loams inclined to be sour, for which wood ashes cannot be employed with profit."

## ALKALI SOILS.\*

Alkali soils occur in arid or semi-arid districts only, and these in Canada may be said to be restricted to certain areas in British Columbia, southwestern Alberta and in a limited degree Saskatchewan and Manitoba.

Two classes of alkali are generally recognized "white" and "black."

White alkali consists chiefly of the sulphate and chloride of sodium (Glauber's salt and common salt).

Black alkali is characterized by the presence of sodium carbonate (washing soda), which through its solvent action on decayed vegetable matter gives a black incrustation to the soil.

Soils impregnated with alkali are injurious to vegetation, but the greater number of alkali soils when freed from excess of alkali are exceedingly fertile.

Black alkali is more injurious than white alkali.

Alkali soils can be reclaimed by thoroughly washing out and carrying away the alkali. If the natural drainage of the soil is not good, flooding by irrigation should be preceded by the construction of an adequate system of under-drainage.

The black alkali in soils can be converted by the application of land plaster (ground gypsum) into white alkali, which, as already stated, is a milder form as regards vegetable life. In this way large tracts of useless soil in the United States have been effectively and cheaply reclaimed. If the black alkali is only present in

<sup>• &</sup>quot;Alkali Soils," by F. T. Shutt, M.A., F.I.C., Dominion Chemist.