

Farm Laboratories during the past twelve years clearly show that the soils of Canada compare most favourably with those of Europe as regards the quantities of these essential constituents. Lime is also present in widely varying proportions. Where a soil has been partly or largely formed from the disintegration of lime-stone rocks, this element is usually present in sufficient quantity for all the requirements of plant growth for many years; but where the rocks from which the soil has been mainly derived contain little or no lime, this ingredient is sometimes deficient. Where lime forms less than one per cent it is deemed wise to give an occasional dressing of this substance, especially to such soils as are of a clayey nature.

SOIL EXHAUSTION BY GROWING CROPS.

The extent or rate of soil exhaustion from cropping is indicated by the particulars in the following table, which gives the approximate amounts of the essential elements of fertility removed in ten years from an acre of land by ordinary farms crops, where the yields mentioned are obtained.

PLANT FOOD REMOVED BY CROPS IN TEN YEARS.

Yearly yield per acre.	Nitrogen.	Phosphoric Acid.	Potash.
	Lbs.	Lbs.	Lbs.
Timothy hay, two tons per acre.	600	400	900
Oats, 50 bushels per acre of grain with 2,200 lbs. of straw.	460	164	356
Spring wheat, 25 bushels of grain per acre with 2,200 lbs. of straw.	422	233	395
Barley, 35 bushels per acre of grain with 2,000 lbs. of straw.	325	164	270
Indian corn grown for fodder to the late milk or glazing stage, 15 tons per acre.	660	330	1,170
Turnips, roots only (the tops being left on the land to plough under), 15 tons per acre.	540	300	1,140
Mangels, roots only, 15 tons per acre.	570	270	1,149
Carrots, roots only, 15 tons per acre.	600	270	780
Sugar beets, roots only, 15 tons per acre.	630	240	1,110
Potatoes, tubers only, 200 bushels per acre.	408	192	684
Apples (trees in full bearing), fruit, leaves and wood.	650	150	900

We thus see that reduced yields must inevitably follow successive cropping (unless plant food is from time to time returned); for the amounts given in the above table represent for the most part withdrawals from that limited store of immediately available plant food to which we have already drawn attention. If, during the ten years referred to, the land has had regular dressings of barn-yard manure, say, once in five years, of about 20 tons to the acre, there would by this means be restored to the soil about 400 lbs. of nitrogen, 200 lbs. of phosphoric acid, and 360 lbs. of potash, with the further advantage of a large addition of humus. With a suitable rotation of crops this return would do much towards making up the losses mentioned.

The crop producing power of soils is also lessened under such circumstances as we have referred to, by the wasting of their organic matter. Humus,

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