1871

PLAIN DIRECTIONS

FOR USING THE INVALUABLE FERTILIZER,

MANUFACTURED FROM

CANADA PHOSPHATE,

By the Brockville
Chemical and Super-Phosphate Co.,

BROCKVILLE, ONT.

BROCKVILLE:
Printed at the Monitor Office.
1871.

8

Chemical and Super-Phosphate Co.,

BROCKVILLE, ONT.

To the Farmers of Canada.

This Company desires to imform the farmers of Canada, that there have been erected at Brockville extensive Chemical works, for the Manufacture of Sulphuric Acid and other Chemicals, but more especially to manufacture Super-Phosphate of Lime from the rich native mineral phosphates of Canada, and a full supply of this superior and invaluable fertilizer will be ready for sale for this Spring's crop.

It is proposed to make a strictly standard article guaranteed to be of uniform quality, and equal to the best Super-Phosphates of England and the United States.

Super-Phosphates have been very extensively used in England, Scotland and Ireland for more than 25 years, and in the United States for over 20 years. When carefully and properly prepared they have invariably given entire satisfaction to the farmer.

This fertilizer has hitherto been but little used in Canada, probably on account of the high price of the materials necessary in its manufacture, such as bones or their equivalent, and Sulphuric Acid. The latter article has only lately been manufactured in Canada. Its liberal use is absolutely necessary in order to produce a really good Super-Phosphate.

This Company have erected at great cost apparatus for the manufacture of Sulphuric Acid and Super-Phosphate from materials taken from mineral deposits owned and mined by the Company. The ownership of mines and material is an advantage which will result in the production of a superior fertilizer at less cost to the farmer than the same quality could possibly be obtained in any other country.

Every intelligent farmer must be aware of the enormous con-

sumption of Super-Phosphates in the Old Country, and of the great benefit resulting from their use. Our farmers in this country need this manure more than the farmers on the other side; especially is it needed on those wheat lands which from continual cultivation show a constantly decreasing return; and it is honestly believed, that after a trial, no farmer will put in a crop without using this fertilizer.

When Super-Phosphate is applied to Wheat, Rye, Barley, Corn, Potatoes, or in fact any Crop, the result will be a large increase of the same, its effects being seen for many years.—Consequently it is not a mere stimulant but a permanent improver of the soil.

In offering this Super-Phosphate to the farmers of Canada, the Company does so with entire confidence that it will meet the wants and satisfy all who will give it a fair trial. The patronage of the entire farming community is therefore solicited.

This fertilizer will be put up in packages, of about 200 to 300 lbs. each.

All orders addressed to "The Brockville Chemical and Super-Phosphate Company," Brockville, will be promptly attended to.

ALEXANDER COWAN,
Manager.

Directions for Use.

The following general directions are based upon the experience and experiments of practical farmers, together with the experience of one of the proprietors himself, who has used the Super-Phosphate in a variety of ways on general crops. The application must be varied in accordance with the nature and condition of the soil. The farmer, therefore, may use his own judgment in regard to quantity and manner of application.

FOR WHEAT.

Use from 300 lbs. to 400 lbs. to the acre, sown broadcast and harrowed or drilled in with the seed; some plough it under lightly, but harrowing is the better way.

Super-Phosphate is without doubt the best manure that can be applied on this crop—either Spring or Fall Wheat. Not less than 300 lbs. should be applied per acre. It will cause a quick and vigorous growth in the Fall; thus giving the seed a strong root to withstand the frost, and the grain will generally mature and ripen earlier than where barn-yard manure is applied. The heads fill better, the grain is more plump and will weigh heavier.

FOR OATS AND RYE.

From 200 lbs. to 300 lbs. to the acre, sown broadcast and harrowed in with the seed, will produce a large yield of either.

FOR BUCKWHEAT.

An application of 100 lbs. per acre is sufficient for this crop, and will produce a large yield.

FOR CORN.

The usual mode of application to this crop is to sprinkle about a *handful* to two or three hills, scattering it well, and covering it with earth. Then drop the corn and cover with the hoe.

We think the best plan is to sow about 300 lbs. to the acre broadcast, when preparing the ground, and harrow in before striking out rows; then apply about 100 lbs. to the acre, in the hill when planting, which is about a *spoonful* to a hill, taking care to scatter it, and cover well with earth before planting the seed. In this manner it takes about 400 lbs. per acre, and will generally increase the yield of corn to double that not treated with the Phosphate.

FOR POTATOES,

Apply from 400 lbs. to 500 lbs. to the acre. If planted in hills, first drop the potato and when covered with soil, then scatter well a *good sized handful* of Super-Phosphate, and cover all up as usual. If planted in drill, first drop the potato and cover lightly with a hoe; then sow a large handful of the Phosphate to about a yard of drill, well scattered in the centre, letting a portion go to the sides of the drill; then cover with the plough as usual. In many localities barn-yard manure cannot be used on potatoes from the fear of rot. There is no risk of that kind with Super-Phosphate, it is rather a preventative of the rot, and with 500 lbs. to the acre, will produce an abundant yield on very ordinary soil.

FOR GRASS.

Sow broadcast during the Fall or early in the Spring before the frost is out of the ground, or any time after, before the grass gets so high as to prevent the Phosphate reaching the surface of the ground. Apply about 200 lbs. or 300 lbs., per acre. It will greatly increase your pasture, and more than double the quantity of hay.

For Cabbage, Beans, Peas and other Vegetables,

For these we can give no explicit direction. The quantity applied should be from 300 lbs. to 500 lbs. per acre. On Cab-

bage the best way to apply it is to scatter about half a handful where you intend to set the plant, in a surface, say 8 inches in diameter; run your dibble directly through it, and set your plant as usual; after which cover the Phosphate with the hoe and at next hoeing draw it towards the plant. When used on Peas, scatter well in the rows when sowing the peas, and cover together. For Lima or any other Beans in hills, a handful to two or three hills. For Beans in drills, same as peas. For Tomatoes, apply same as for cabbage. For Onions, sow in drills or broadcast. On other garden vegetables it can be applied as the judgment of the gardener may dictate. It is an excellent manure for Spinage and Sprouts.

For Turnips, Carrots and Sugar Beets.

This fertilizer is a *speciality* for all these root crops, and when applied at the rate of from 300 lbs. to 500 lbs. per acre, will produce enormous crops. Our farmers should cultivate root crops more extensively for feeding their horses and cattle than they do. When properly cultivated few crops will pay better.

FOR TOBACCO AND SORGHUM.

Apply from 200 lbs. to 300 lbs. to the acre at the time of planting. In the application, it must be well scattered in the rows, and covered in with the seed.

To Gardeners and Florists.

This fertilizer, being in a finely pulverized condition, is easily applied, and will be found highly advantageous in the cultivation of Plants and Flowers, and will produce the most satisfactory results.

CAUTION.

The above are the general directions usually given for the application of Super-Phosphates, but the Phosphates made by this Company, being so much stronger than usual, it will be necessary in case of planting to scatter it well and cover it with earth in order to prevent injury being done to the seeds by coming in contact with it.

FERTILIZERS.

(*Note on Phosphatic Manures,*)

The importance of making a proper use of our CANADIAN PHOSPHATES has long been urged by the Geological Survey, and more especially by Dr. T. Sterry Hunt, F. R. S., who has published many important notices of Canadian Apatites. We quote from the report of 1847, now unfortunately rather rare, and would wish it to be remembered that words then spoken are ten times as applicable to the present state of affairs :

"The Phosphate of Lime is largely contained in wheat, and the exhaustion of this ingredient is one great cause of the sterility of our worn-out wheat lands. In a grain-growing country like Canada, therefore, the existence of such deposits as these will prove of great importance."

"Under these circumstances, the limestone just described, which contains throughout it a large supply of this important substance, is certainly well worthy of the attention of our agriculturalists."

There is also much written in the general report of the Geological Survey of Canada, showing the localities where the Mineral Phosphate of Lime is to be found, and also the mode of preparing it for use.

Mr. Gordon Broome, F. G. S., of the Geological Survey of Canada, who has given much attention to the practical bearings of Canadian Phosphates upon the Agricultural interests of this country, and who has made a number of experimental trials calculated to throw light upon the subject, lays especial stress upon the following facts :

1. *It is just as necessary to supply food to plants as it is to feed animals.*

" 2. With regard to the relation of phosphates to plant life, " we have, first of all, the well established fact that a deficien- " cy of them in the parent soils produces a corresponding less- " ening of the weight of the crop, and renders it, moreover, " very liable to various diseases; and that the addition of phos- " phorous compounds, in a state fit for the nourishment of the " plant, always effects a great increase of yield."

"3. Among the numerous sources of wealth included within "the vast thickness of the Laurentian system, few are invested "with a larger amount of interest than the mineral Phosphate, "a substance already ranking among our economics, and prob- "ably destined to constitute, in future, one of the most impor- "tant of the raw materials of British North America, one of "those sinews of the country, upon which her industrial ad- "vancement must ever be primarily founded."

The Phosphates derive their chief importance from their great powers of restoring exhausted lands to their original fertility, of increasing the yield of good soils, and of raising the value of such as have been always more or less valueless for Agricultural purposes. Phosphoric acid is absolutely necessary to the bodies of animals: since Phosphates occur in the brain, and also *form more than* 58 *per cent of the mineral in their bones.*

"Animals obtain their phosphates entirely from plants; and "they can do this because all plants fit for food contain much "of these substances. The following table shows how much "Phosphoric Acid there is in the ashes of different crops com- "mon in this country and in the United States:—

TABLE I.

	per cent.
Rice	53
Rye	50
Wheat	50
Maize	45
Oats	44
Barley	39
Beans	38
Peas	33
Turnips	13
Potatoes	13
Clover	18
Cabbage	12
Leaves of Grape	18.3
White Oak	12.7
Cotton (wool of)	11.6
Tobacco	6.5
Fibre of Flax	6.2
Bean Straw	7
Peas Straw	5
Turnip Tops	9
Potatoe Tops	8
Beet root	8
Meadow grass	8

And here we may add the amounts present in different common substances important to farmers:—

TABLE II.

	per cent.
Ox Bone	12.0
Man's Bone	9.0
Extract from Cheese	1.5
Milk	.7
Matters of the Blood	.5
Bread (about)	.5
Hen's egg shell	.6
Urine (solid from)	5.0

etc., etc., etc.

The greatest authority in England on these matters, the late Dr. Miller, [Vice President of the Royal Society, and Author of Manual of Chemistry, etc., etc.,] says distinctly: "Phosphoric Acid is essential to the growth of the bones in young children;" and, besides this, Dr. Prout states that the phosphorus in blood, in all probability exists as *Super-Phosphate of Lime.* "In diseased bones the proportion of phosphates is much lowered, and all doctors apply Super-Phosphates or similar compounds to supply the deficiency."

The same must be done in the case of poor crops, or diseased grain, or wherever increased yield is desired.

Over untilled lands the phosphates are taken from the soil by plants and animals, and returned to it whenever they die or decay. But, in inhabited and settled countries, owing to the concentration of populations in towns and cities, one link, so to speak, in the chain, becomes faulty, and the return of phosphates to the soil must be aided by artificial means.

From whatever lands vegetable matters are removed in the annual crops, there is a constant withdrawal of the minerals necessary to the growth of the plant, including, of course the phosphoric acid; and, poor or exhausted lands have become deficient in such phosphates as are available for the use of the growing plant; and do not, especially, contain enough to suffice for grain or root crops, containing, as they do, a heavy proportion of phosphates.

The grain of wheat contains about 8-10ths per cent. of phosphoric acid, which proportion amounts to 16 lbs. of the acid to each ton (2000 lbs.) weight of wheat. Now the amount of phosphoric acid in soil may be said to average 0·2 per cent.; although, except in clays, the proportion is usually less, and hence there exists in the soil covering one acre of land, to the depth of 12 inches, about 68.6 lbs. of phosphoric acid; or only enough to

supply the phosphates to 4.16 tons of wheat. The total weight of wheat, (whether as grain, or in the state of flour) exported from the port of Montreal in 1869, was about 292,534.5 tons*; or a weight corresponding to all the phosphoric acid from 70,320.8 acres (=109.8 square miles) of good average land.—This withdrawal equalling 2,340 tons, would require, in order to counterbalance the loss, the annual employment of 5,850 tons of apatite, *containing 88 per cent. of phosphate of lime* or 13,728 tons of "super-phosphates" of good quality.

The corresponding money value, at $35 per ton, makes the total annual deficiency no less than $480,480. Or if we include the loss from shipments of Corn, Peas, Barley, and Oats, *the yearly loss may be estimated at no less than* $530,191.

Moreover, the exports of wheat from British North America are only about 7½ per cent. of the total amount received by Britain: so that the phosphoric acid, exported by foreign countries for consumption in England, in the shape of wheat alone, *amounts to no less than* 31,200 *tons, and represents a money value of about* $6,406,400 *annually.*

Adding to this the imports of mineral phosphates, we have a *grand total of* $15,156,400.

From these figures it is at once evident that, wherever no phosphates are employed by agriculturalists, the exhaustion of lands by crops is by no means a slow process; and it is therefore absolutely necessary for the farmer to restore to the soils the substances of which they have been robbed, in the way shown by the great German Chemist, Baron Liebig.

This may be partly done by farm-yard manure, but the expense of hauling it in this country, at a busy time of the year, makes it very much dearer than the rich "*Super-phosphates*" made at our Chemical Works: the quality of which has been shown by repeated tests, by Dr. Hayes of Boston, and by Mr. Broome in Montreal, (in the Laboratory of the Geological Survey) to be equal to many of the best English Articles, and probably cheaper than any of them.

The Super-Phosphate made at the Brockville Chemical Works contains 10 to 20 times as much valuable Phosphate as there is in farm-yard manure. "The small amount of "success met with in the employment of Super-phosphates "in this country is chiefly owing to a want of the necessary "knowledge or spirit of enterprise amongst the farmers "themselves."

Hence it arises that there are already so many partially, or

* This information was kindly furnished by Wm. J. Patterson, Esq., Secretary to the Montreal Board of Trade.

even wholly exhausted soils in Canada, and more especially in the Province of Quebec, which might have been still yielding large returns of wheat crops, had they been, from the first, subjected to a proper system of tillage, coupled with the judicious and periodical use of phosphatic manures. The prosperity of many farms in England is wholly due to advancement in the employment of fertilizers, by which the losses of Phosphates are made good. These losses of Phosphates are especially great in those newly peopled lands, whose rich virgin soils have constituted them the granaries of the Old World.

Thus a very large proportion of the vegetable produce of North America, in the shape of cotton, wheat, sugar, and tobacco, is employed in ministering to the necessities of European countries; and the result is a stupendous annual withdrawal of their necessary constituents from all soils occupied in satisfying these ever-increasing demands, and this is especially true with regard to their limited quantities of the salts of phosphoric acid.

Phosphates were used in England as early as 1770; and if Canada desires to become of growing importance as a wheat producing country, the same principles must be here applied as have been so useful in Europe. The success already attained begins to be shown in the increased productiveness of many fields and gardens upon the confines of London.

Even in 1854, the value of the *super-phosphates* manufactured from mineral sources in England was as much as $8,750,000; and the yearly demand for the cotton lands of the Southern States of America is probably now about $2,800,000.

In no place, probably, are natural manures more judiciously farmed than in the Channel Islands, on the coast of Normandy, celebrated for their rich pastures and excellent breed of cattle; and on the Jersey coasts, the extensive flats, existing between high and low water-mark, are actually portioned out into lots belonging to the different farmers, who, in the autumn season, —for the law only then permits its removal,—gather in the rank sea-week (termed Vrjack) as scrupulously as they harvest the produce of their fields, which mainly owe their fertility to these rich manures. Large quantities of the Laurentian apatites, on the shores of L. Rideau, in Canada, can be obtained, averaging from 60 to 85 per cent.; and the only wonder is that they have not been utilized long since, comprising as they undoubtedly do a source of much prosperity.

Super-Phosphates are consequently furnished by us at rates far lower, in comparison with their value, than any manures obtainable in the country.

They should be used liberally and judiciously, either alone or

well mixed with ordinary manures, in the proportion of from 100 to 200 lbs. to every ton of muck. They must be spread thinly over the sown land, or upon grasses, or young root plants, clover, etc., at the times most convenient and formerly usual. The same care and precautions should be taken as in ordinary manuring.

By this means, at the cost of at most from $1 to $3 per acre, the yield can be maintained at 30 bushels per annum, wheat can be sown oftener, and instead of a decrease such as has formerly occurred, (often to a runious extent,) a larger product can be got by expending scarcely 1-20th of the sum usually required.

Many of the foregoing facts have been obtained from the works of Scientific and Practical men in England, and upon this continent, and not a few from the Essay already published by Mr. Broome which we advise every farmer to read for himself,* as well as from notes as yet unprinted. In concluding the first part of his work, Mr. Broome remarks :

"I cannot conclude without giving expression to one thought, strongiy impressed upon my mind by the consideration of these topics; namely, that the comparatively dormant state of this, and many equal obvious sources of industry in Candna, arises from great deficiency in a most important division of our national education; and that nothing, save a liberal augmentation of the ordinary courses of instruction in modern subjects, can ever prove effectual in dispelling the immense existing cloud of ignonorance and prejudice. It is, therefore, sincerely to be hoped that the very able remarks, recently made by Principal Dawson upon this question, may have their desired effect; and that Canada may speedily obtain a share in the improvements that have, of late, almost revolutionized the systems of education prevailing in the universities of the mother country.

*To be had at Dawson's, Montreal, or by ordering from any Bookseller in the Dominion. See also proceedings of American Association, 1870.

Recommendatory Letters.

BROCKVILLE, 5th DECEMBER, 1870.

DEAR SIR,—I made a trial of your Super-Phosphate last Summer upon my sweet corn with most satisfactory results. In order to establish a comparison, three rows were planted with, and three without the fertilizer, side by side, in the same kind of soil. Before depositing the seed, about a table spoonful was sprinkled over the bed in a space of six inches diameter.

When the corn was about a foot high the most marked contrast was observed. That which had been treated with the *Super-Phosphate* was of a darker green and more vigorous growth than the rest. The same difference was observable throughout the season, which as you remember was very dry. The stalks grew taller by two feet, and the corn was fuller and more perfect in the ear, and its flavour was superior to any I have ever tasted. I shall always use it in future, and I am sure it will be found very valuable, especially in dry seasons.

Yours sincerely,

SAMUEL KEEFER.

MR. ALEX. COWAN,
Manager,
B. C. & S. Works, Brockville.

ELIZABETHTOWN, Nov. 2nd, 1870.

ALEX. COWAN, ESQ.,
Manager of the Brockville,
Chemical and Super-Phosphate Co.

DEAR SIR,—Having used the Brockville *Super-Phosphate*, made by the Company you represent, as manure, I can recommend its use to my neighbors and the farmers of Canada generally. Having tried it on Corn, Potatoes, Peas and Oats, with the following results, though the season was so dry as not to do it justice.

On about a quarter of an acre of peas and oats, sown on poor

soil the *Phosphate* was applied by sowing broad cast, when the grain was about ten inches high, at about the rate of 300 lbs. per acre, and the result was one of the finest crops ever raised on the same ground.

An acre and a half of corn was planted in the following manner: the field was furrowed out in drills 3½ feet apart, and lines drawn across them at right angles. The *Phosphate* was applied by scattering in the space formed by the lines across the drills, and covered lightly with earth; the corn was then dropped and covered, and by way of experiment, spaces of six or eight rows were left in different parts of the field without any *Phosphate*, and although the season was very unfavourable, the rows with *Phosphate* in them yielded nearly double as much as those without any.

An acre and a half was planted with potatoes, and only four rows had *Phosphate*, a small handful being applied to each hill; these rows yielded half as much more as those alongside without any *Phosphate*.

ABIATHER BILLINGS.

ELIZABETHTOWN, 4th Nov., 1870.

To ALEX. COWAN, ESQ.,
Manager of the Brockville,
Chemical and Super-Phosphate Co., Brockville.

DEAR SIR,—I purchased last Spring two barrels of your *Super-Phosphate of Lime*. I tried it on Barley and Peas, sown broadcast and harrowed in with grain. Where it was applied I had one-third more barley, and double the quantity of peas over the other parts where there was no application.

By the success of the experiment of the purchase in the Spring, I was led to purchase $50 worth to apply to fall rye. I sowed it broadcast, and harrowed it in with the grain, and the result now is much beyond my anticipations; so strong is the fall rye that I am afraid it will smother in winter unless fed down by sheep. This fall crop was put down with grass seed so as to secure a good meadow. The grass seed could not have taken better.

The quantity used per acre was about 500 lbs., but I find it was unnecessary to use such quantity for any ordinary crop.

Another great advantage in using your *Super-Phosphate* over barn-yard manure is that there is freedom from noxious weeds which are so damaging to a farm.

I find it a great advantage to be able at any time to pur-

chase and apply in one day, particularly at the busy season of seed-time, sufficient manure for any field.

JONAS ABBOTT.

PERTH, 8th NOVEMBER, 1870.

To ALEXANDER COWAN, ESQ.,
Manager of the B. C. & S. Co., Brockville.

DEAR SIR,—I used your *Super-Phosphate* on a patch of Early Rose Potatoes, putting the *Phosphate* on alternate drills, or rows, and found a great difference. The rows I put the *Phosphate* on, came through the ground two or three days sooner than the other, and the potatoes were much larger and better when dug. One of my potatoes weighed two pounds six ounces, and a great many over one and a half pounds.

ROBERT GEMMELL.

PERTH, ONT., 16th DEC., 1870.

A. COWAN, ESQ.,
Brockville, Ont.,

DEAR SIR.—I have used your *Super-Phosphate of Lime* this season on potatoes, and find it to be an excellent Fertilizer. I put half a barrel on about half an acre, and had a yield of about 150 bushels. Where many of my neighbors' average yield was not more than 50 bushels off the same amount of ground.

Very Respectfully,

GEORGE OLIVER.

A COWAN, Esq., Brockville, Ont.

BROCKVILLE, Nov. 5th, 1870.

To ALEX. COWAN,
Manager of the Brockville and Super-Phosphate Co.

DEAR SIR,—I have pleasure in recommending your *Super-Phosphate of Lime* as a fertilizer. I used it according to your directions, and found that where it was applied I had fully double the quantity of vegetables that I had where none was applied.

I left some rows of potatoes without the Fertilizer, and in these I dont think I had half the quantity which I had where the *Super-Phosphate* was applied.

I am,
Yours Truly,

L. HOUGHTON.

ELIZABETHTOWN, 5th Nov., 1870.

ALEX. COWAN, ESQ.,
Manager of the Brockville Chemical and Super-Phosphate Co.

DEAR SIR,—I purchased from your Works last Spring half a ton of *Super-Phosphate of Lime* and applied it with the following results:

I selected about two-thirds of an acre and applied your *Super-Phosphate* by sowing broad-cast, at the rate of about 300 lbs. to the acre, and the result was as good a crop of corn as where I had applied at about the rate of 40 (farmer's) loads of barn-yard manure to the acre, and the corn was from a week to ten days earlier on that to which the *Phosphate* was applied.

I also by way of experiment tried a top dressing around hills of corn about at the rate of 50 to 75 lbs. to the acre on land which had been heavily manured. I took the same value in money and applied plaster and ashes in same manner, and the corn which had the *Phosphate* applied gave best results, the corn being rather heavier in ear and stalk.

I also applied it in the garden to Cabbages, Caulliflowers and Tomatoes, and found it to be equal in results to the best manure, and not so costly, the Tomatoes being from 10 to 15 days earlier than where none was applied.

GEO. R. SNIDER.