

triplicated—accidents as to measurement, too much or too little manure or seed, easily occur.

The plots may be of any size you may choose: I believe in largish ones—say, one-fourth of an acre—but you may take four-rod plots, if you like, i. e. eleven yards square.

The plots should be laid out, side by side, in a part of the farm which, as nearly as possible, represents the quality of the general soil of the whole. The spot will be easy to select on the alluvial lands, but where sand, loam, and clay exist on the same farm, it will be absolutely necessary to establish experimental plots on each of the different soils.

Each plot should be separated from its neighbour by a path—two feet wide will do—and a wider path still should encompass the whole.

Now comes the question: what manures shall we try? In answer to this question, I shall assume that the land to be interrogated contains already every matter necessary to perfect the growth of plants in sufficient quantity, except nitrogen, lime, phosphoric acid, and potash. I assume this, because I do not think it requires any proof: every one seems to be satisfied on this head. And, first, of nitrogenous manures.

The principal sources of nitrogen, as found in the manure market, are: Sulphate of ammonia, nitrate of potash or salt-petre, and nitrate of soda.

Sulphate of ammonia is composed of sulphuric acid and ammonia, and contains, in a state of purity:

	p. cent.
Sulphuric acid.....	60 60
Ammonia	25 76
Water	13 64
	100 00

And as the ammonia consists of:

Nitrogen.....	14 00
Hydrogen.....	3 00
	17 00

it follows that sulphate of ammonia, when perfectly free from adventitious matter, contains 21.21% of nitrogen. The sulphate of ammonia of the Montreal gas-works is generally found to contain about 20.60% of nitrogen, and is sent out in a creditable condition. As the supply is no greater than the demand, the company can hardly be expected to lower the price, though I devoutly wish it would; for if this manure could be sold at the same price it fetches in England, a marvellous change would be soon effected in the yield of our Canadian crops. Nitrogen is the most important of all manures: the alteration visible in a weakly crop of grain after a top-dressing of 100 lbs. to the acre of sulphate of ammonia, is a sight to be seen.

M. Ville accounts for the wonderful change worked by so small a dose of nitrogen on a weakly crop of grain in the following words:

“Plant life consists of three distinct periods:—1. The embryonic period, during which the young plant grows at the expense of the seed”—as may be seen during the germination of barley in the maltsters “pieces.”—“2. The foliaceous period, which is essentially the creative period of the crop, during which the plant lives on the air and soil. 3. The reproductive period, during which the plant forms its seed, and lives at its own expense. This epoch in the life of the plant I have also called the re-absorptive period, to mark distinctly that the activity of the plant is then removed, and concentrated in the flower and fruit, the formation of which is brought about by means of the substances accumulated in the leaves and stems. Now, at the close of the winter, the substance of a part of the leaves has been partially changed by the action of the cold, and vegetation is retarded by the

nutritive elements, nitrogen, phosphoric acid, potash, and lime, having a tendency to withdraw from the work of vegetation, when they are, of course, lost to the whole vegetable system. A small dose of sulphate of ammonia will be sufficient to revive the vitality of the leaves, and cause these substances to contribute to the production of the seed.” The above refers to the case of fall wheat, but is equally true of any spring-sown grain which is at a stand-still for want of its proper food.

I should not exceed the quantity of 100 lbs. an acre of this manure, unless the land is very poor, for fear of the leaf-growth becoming superabundant, which would probably lead to the laying of the crop, unless the season were very dry, when it might be burnt up.

Nitrate of Soda.—Is, I believe, to be had at the powder-works at Belœil and Hamilton. I do not know the price, but the composition is as follows:

	p. cent.
Nitric acid.....	63 53
Soda	36 47
	100 00

Nitrate of soda, then, when chemically pure, contains 16.4% of nitrogen. It comes from Peru, where it is found in compact masses, mixed with sand and sea-salt.

It is usually sold in England with what is called a “refraction” of 5%, and its composition is, with that allowance:

	p. cent.
Nitrate of soda.....	95 45
Chloride of sodium (common salt).....	1 62
Moisture.....	2 25
	99 32

The remainder is sand. Thus, the average sample contains about 15.75% of nitrogen; so, if sulphate of ammonia be worth \$70.00 a ton, nitrate of soda should fetch \$54.00, nearly; and, if 100 lbs. of the sulphate of ammonia be a proper dose for an acre of land, 130 lbs. of nitrate of soda should have the same effect; though, practically, I have always found that the nitrogen in the form of nitrate of soda has a greater effect on the growth of the stem and leaves of the grain-crop, than when it is applied in the form of sulphate of ammonia. I cannot assign any reason for this, and I should like very much to try the experiment over again. Perhaps I may have a chance this summer.

Ammonia in the form of sulphate may be applied as a top-dressing in one dose, but nitrate of soda had better be given at twice, and will answer better if sown when the leaf of the plant is moist with rain or dew.

Both these manures should be mixed with about twice their bulk of fine mould and very carefully distributed. Ashes, wood and coal, will do, if the manure be spread immediately after mixing.

Nitrate of potash.—Is thus composed:

	p. cent.
Nitric acid.....	53 41
Potash	46 59
	100 00

A most valuable manure it is, containing nitrogen and potash, both in a very assimilable form. What a pity it is that its cost is too high to admit of its use with profit. It might answer, perhaps, if tried on tobacco, provided that the merchant would pay for quality of leaf. Kainit is so cheap now, that all other forms of potash, for manurial purposes, are practically out of the market. I do not mean to say that it is cheap in this country, but every where else it can be