

An attempt was recently made from this office to ascertain the extent of the fertilizer trade in Canada, but the returns obtained were incomplete and can only serve as the foundation for an approximative estimate. The latter cannot be placed higher than 3,400 tons, which was the probable quantity of fertilizers sold in the Dominion last year. From this it appears that the trade is as yet in its infancy, and that "high farming" is still unknown in Canada. The prices here are, on the whole, lower than in the United States, where at least a million tons are made use of annually.

Canadian farmers seem to entertain a prejudice against the use of fertilizers, owing to the apparent high prices charged for them. In a former report addressed to you, dated 20th December, 1886, and published in Supplement III to the departmental report of that year, I called attention, among other matters, to the fact that the cost of fertilizers is greatly increased by the admixture of substances containing nitrogen, which ingredient might be saved by the exercise of a little care on the part of the farmer. Since you may possibly authorize the publication of this report, I take this opportunity of mentioning a few particulars connected with this subject which may be of interest to agriculturists generally.

If we take the case of an ordinary compound fertilizer, containing, say, 3.6 per cent of nitrogen, the cost to the manufacturer of introducing that quantity into it amounts to \$10 per ton, which the farmer must pay if he purchases, and which he is perfectly capable of saving in his own stables or producing upon his own farm. It has long been known that stable-yard manure experiences considerable loss of its fertilizing constituents, but more especially of nitrogen, when left to itself in the dung heap. According to the experiments of Wolff, this loss amounts to 55 per cent of the nitrogen contained in fresh manure from horned cattle. The later experiments of Heiden and Holdefleiss place it at 23.4 per cent. These results were obtained when ordinary reasonable care is taken of the manure, but give no data for estimating the loss which occurs when, as is most frequently the case in Canada, the manure is treated with the grossest neglect. It is safe to assume that generally 50 per cent of the nitrogen contained in the barnyard manure of this country returns unutilized to the atmosphere. Assuming that an average quantity of 36,000 lbs. is produced annually by each animal, and that it contains 0.4 per cent of nitrogen, it follows that a loss of 72 lbs. nitrogen, worth \$10.08, takes place for each head of cattle. This loss can be prevented by strewing amongst the manure in the stables about 700 lbs. ground plaster for each head, at a cost of about \$2.50 per annum. By doing this the farmer would be relieved from the necessity of purchasing the nitrogen of agricultural fertilizers.

Not only can the farmer thus save the nitrogen of his barnyard manure, but he can actually increase the stock of it stored away in his fields, products and dung heaps. Recent investigation has shown that certain crops have the power of appropriating the nitrogen of the atmosphere, and that, by a judicious course of crop rotation, the farmer may take advantage of this fact to enrich his farm. For more than a century, agricultural chemists have discussed the question as to whether free atmospheric nitrogen can be assimilated by plants, and probably the controversy would have continued without result to the present hour had not a practical agriculturist, named Schultz, in North Germany, thrown light upon the subject by means of his trials on the large scale, and the manner in which he described and explained these to his countrymen. König, of Munster, gives the following summary of Schultz experience:—

"Schultz acquired the farm Lupitz in the year 1855; its soil consisted of a poor, cold diluvial sand; the profit in working it was very small. Lupines yielded indeed as fodder tolerable results, but when used as green manuring for rye or oats, no return was obtained from them. The application of artificial manures produced good crops, but they did not pay; burnt lime showed itself to be too heating. The use of manure was more favourable, especially when fertilizers containing phosphoric acid were used at the same time. But at the best the total result was not satisfactory.