

lodging of grain, and causes the crops to mature faster—a very desirable tendency on heavy soils in this climate. It is claimed that these secondary advantages are very frequently sufficient to pay for the outlay, even if no increase in the crop had taken place. These secondary advantages are a good guide in determining where the superphosphate is likely to give good result. It is evident that on a soil which produces short, stiff straw, which would not lodge on any consideration, and which matured its crops rather too rapidly, superphosphate is not the fertilizer most required. A nitrogenous fertilizer would be more in place on such soils.

There are two kinds of superphosphate in general use in Canada. The one is made of bone and the other from apatite—a rock found in various portions of the earth's crust. The composition of the various brands is very varied, and the purchaser should, therefore, insist upon a guaranteed analysis accompanying all the fertilizers he purchases. In these analyses he will, or at least should find the amount of insoluble and soluble, or available, phosphoric acid given. The market price of the former is at present from 1½c. to 2c. per lb., and that of the latter 5c. to 7½c. per lb. The bone superphosphate contains also more or less nitrogen, which at present market prices is worth from 13c. to 16c. per lb. Some manufacturers do not give the actual amounts of soluble phosphoric acid, but the percentage of the insoluble phosphoric acid made soluble. If, therefore, a manufacturer stated that 15 per cent. of his fertilizer has been made soluble, and that the original contained 70 per cent. of phosphate of lime, or, what is the same thing, 29 per cent. of insoluble phosphoric acid, it would not contain 15 per cent. of soluble phosphoric acid, as the inexperienced purchaser might believe, but only 15 per cent. of 29 = 4.3 per cent. of soluble acid. This complicates matters very much, and gives fraudulent manufacturers an opportunity of leading their customers astray, and the latter should, therefore, carefully investigate the matter and see that the actual amount of both soluble and insoluble phosphoric acid is mentioned in the analysis. Another point on which the inexperienced purchaser is liable to make a mistake, is to confound phosphoric acid and phosphate of lime. The latter compound (a chemical union of three parts of lime and two parts of phosphoric acid), is the form in which it is usually found in nature. It is an insoluble compound containing nearly 46 per cent. of phosphoric acid (P_2O_5). The phosphoric acid is the compound upon which the fertilizing value of all fertilizers belonging to this class depends, and it, therefore, forms the basis of all calculations in this class of fertilizers. The insoluble phosphate of lime is made soluble by treating it with dilute sulphuric acid. In this process some of the lime in the phosphate is replaced by water, the sulphuric acid gives off the required amount of water and unites with the lime replaced in the phosphate. By this union of sulphuric acid and lime, the compound, commonly known as land plaster, is formed. If two parts of the lime in the phosphate have been replaced by water, the compound will be soluble in water, and will then be called *soluble phosphoric acid*. If only one part of lime has been replaced, it is soluble in citric acid, and is called *available or reverted phosphoric acid*; and if no lime has been replaced it is termed *insoluble phosphoric acid*. Since it has been discovered that the reverted phosphoric acid generally gives as good returns as the soluble acid, both these forms have been classed together and spoken of as soluble, or available.

(TO BE CONTINUED.)

Ensilage and Pasturage Compared.

W. D. Hoard, writing on ensilage, says:—"Let me say at the outset, that the question is hardly one of latitude or climate. It is a question of storing and feeding. Here, in Wisconsin, we are fast coming to the conclusion that the most costly of our feeds is pasturage. The economy of practice must be measured by results obtained, and wisdom of expenditure. Measured by these considerations, pasturage milk costs us more than any other taking into consideration the fact, that the average acre of the best pasture will not produce more than 1,300 to 2,000 pounds of milk, while an acre of corn fodder put in a silo, will easily produce 8,000 to 10,000 pounds. We find that corn fodder is the most easily, cheaply and safely handled in the silo. The damage from the elements in dry curing is very great, and there is added the loss or waste in feeding. The silo, practically, is a substitute for pasturage so far as the succulence of the food and quick digestibility is concerned, without its expense. Every year in Wisconsin witnesses the increase of those who believe and practice a partial soiling at least, and they do it through the silo. Now, if it is of the highest economy for us to own no waste land, or land which yields a low return; if it is of the highest economy for us to get the largest return possible for the value of the food consumed; if it is of the highest economy for us to put our land in the most effective shape possible for the use of our animals, does not the same economy appeal to you as powerfully as it does to us?"

Silage and the Silo.

BY PROF. A. J. COOK.

Before building a silo I visited silos in four different States, and from conversation with intelligent farmers became convinced that silage takes the place in winter of the succulent feed of summer pastures and is just what our live stock need. While the chemist finds no more nutritious matter in silage than in dried food, our cattle, horses and sheep do. The silage tastes good, and this indicates its superior value as food. Its digestibility and suitability surpasses that of dried food. Silage can be grown and preserved cheaper than the same quantity of corn can be harvested and cared for in any other way. Especially is this true now that we have learned that a silo may be built right in the barn and at small expense. We got from eight to twenty five tons of silage to the acre; and from two to three tons of silage equals in value one ton of the best hay. Thus we can double our stock by use of the silo, and thus double the barnyard manure secured, and so add materially to the fertility of the farm. Convinced of these points, I built a silo, and it has disappointed me only in being too small. I raised no more acres, nor were my crops any better last year than previously. Yet with five acres of my corn crop in silage, I was able to winter more stock than ever before, and my stock never before did so well. For three successive years I had to buy feed to come through the winter; last winter I had some to spare, though the season was so severe and long continued that several neighbors, some who never before had a like experience, paid out considerable sums for feed. My silo is 14 ft. square, inside measure, and 20 ft. high. It cost less than \$30, and paid for itself in one season. This season I shall build another for less than half the money, which I hope will be just as good. I shall build 25 ft. high, from bottom of my basement; shall use

uprights 2x8 in., which will be firmly secured at the bottom, and above every 10 ft., so they cannot be displaced; I shall seal this inside with boards and coat these inside with hot pitch.

Unless this troubles by permitting the silage to freeze, it will be as good as my old silo, which has three thicknesses of boards, one layer of tarred paper and is plastered inside with cement. We need only an air-tight box for a silo, unless we need to make it double-walled to protect against the cold. If I find the latter desirable I can add the outer wall next year. The door of the silo should extend from bottom to top, and as the silo is filled should be closed by use of tarred paper and 8-in. boards, so as to exclude air. Then in feeding we constantly remove from the top, which is easily done, and prevents all molding. Corn is the best crop for silage. It should be grown so as to raise the best crop, if field corn to be harvested the old way were the object. I plant in drills, about ten quarts to the acre, and then use the fine tooth harrow freely till the corn is too large to safely use it longer. The corn should not be cut till the ears are glazed—just when we should cut for husking. It may be allowed to wilt one day, or more, or drawn at once to the silo, as is most convenient. In filling the silo it is doubtless best to fill one day; then wait a day, as the heating interferes with the fermentation. However, last year I filled my silo as rapidly as possible and the silage was excellent; so sweet, indeed, that no one would think of it upon entering the barn; so sweet that our stock would eat it in preference to good corn and oat meal. We cut our corn, ears and all, and by use of a carrier it goes at once high up into the silo. Care should be taken that the silage is well packed about the walls of the silo. The weighting of the silage is not necessary; we need only to cover with tarred paper, then add two feet or so of cut hay or straw, and throw on this a few boards.

A Cheap Silo.

Messrs. Cook, of Denmark, N. Y., in giving their experience, say concerning a plan which they are reported to have tested for five years:—

We did not wish to spend a large amount in an experiment, hence we concluded to build as cheaply as possible. We procured the necessary rough hemlock, half of it one inch and half two inches thick. One bent in our barn was set apart and girts put in about four feet apart. The boards were first nailed on perpendicularly, after which it was planed over, breaking joints to make it as tight as possible. The bottom was two-inch planks laid in sand. This is, in few words, a description of our silo; very simply and easily constructed; the work can be done by ordinary farm-hands. Now as to the result: We never have lost or thrown away any of the fodder; the top, the sides, the bottom, all has been eagerly devoured by our cattle. As a guarantee of our faith in corn silage and this manner of constructing a silo, would say that we shall erect new buildings this season, and increase the capacity of our silo to 250 tons. What was to us an experiment has now come to be accepted as the most improved method of constructing a silo. In fact many, if they choose to build of concrete, should board up the inside, as the corn will be much better preserved. The fodder is put in whole, instead of being cut in small pieces; this reduces expense very much and, moreover, insures sweeter ensilage and no trouble with mold. Our corn is cut and bound in bundles of convenient size to handle without forks. When ready