

jection can be done away with by cutting the clover a little earlier, before all the moisture has left the leaves and gone to perfect the head.

The best time to cut the crop is just as soon as it is well headed out. The leaves will not be so dry or the stocks so woody and coarse as they will be if left until the seed is nearly ripened. Early-cut clover hay will be largely free from dust, and as a nutritive ration for horses, or any other kind of farm stock, it is worth double what timothy is. It is true clover contains so much nutriment that a horse, with its small stomach, will certainly overeat himself if allowed to do so. But we can't see what objection there can be urged to the use of clover for this reason that would not also imply to oats or corn. The horse's rations of clover should be measured out to him, just as are corn and oats, and then all trouble from this cause would be obviated.

From its high nutritive value, and the fact that it never sells well in the city markets, it is good policy to sell timothy, which is worth much less as feed and brings much more in market, and feed out all clover on the farm. The grain ration should be reduced when clover is fed from the amount given with timothy. The latter is very little better, if cut late, than good oat straw.

DRIED FODDER VERSUS SILAGE.

The cost and feeding value of the dry matter of dried corn fodder and of silage is the subject of Bulletin No. 122, issued by the experiment station of New Jersey.

The question of dried fodder *versus* silage has been given a thorough test by the station, and the results of the experiments are summed up as follows:

First, that the cost of harvesting, storing and preparing the dry matter contained in corn was greater in the form of silage than in the form of dried fodder.

Second, that the changes that occur in the composition of silage were not such as to decrease its feeding value in a greater degree than those which occur in the process of curing corn fodder.

Third, that for milk and butter production the feeding value of the dry matter of the silage was greater than that of dried fodder corn. The yield of milk was 12.8 per cent. greater, and the yield of fat 10.4 per cent. greater.

Fourth, at one per cent. per pound for the milk produced the value of the corn crop was nearly \$10 per acre greater when fed in the form of silage, rather than in the form of dried fodder.

PERMANENT STAIRS IN BARNS.

It is very strange how some farmers, year in and year out, will climb up in the barn or hay mow to put in and take out hay, straw and other fodder without the aid of a ladder or stairs, but climb from a manger, box or barrel, grasp a brace, stringer, or other projecting portion of structure, and by an extra effort swing or throw the body upward, and perform similar gymnastic feats to again reach the floor. This is most often done in midwinter when the hands are encumbered with heavy mittens. These operators can thank

their stars that they do not fall, endangering life and limb.

By the expenditure of a few dollars and a day's time an easy and safe way of access could be made to any of these lofts, and one could actually save enough time between the sensible and the careless way in a year's time to cover all the expense of construction. It may possibly make a man more muscular to twist about and hang by one hand to reach the hay mow, but the more considerate prefer the easier plan. In wagon houses in which horses are stabled, stairs should, by all means, be used to reach the loft, as then women and children can often feed the horses with perfect safety. Skelton stairs can be erected with simply the steps and sides, but they should be made strong and firm.

CORRESPONDENCE.

RESTORING LOST FERTILITY.

MR. WALLACE EXPLAINS MORE FULLY THE CLOVER AND PHOSPHATE THEORY.

To the Editor of FARMING:

We must all hail with pleasure the entrance of Mr. John I. Hobson, of Guelph, into this most interesting discussion, and I hope, with you, Mr. Editor, to see other thoughtful farmers take part in it. My statement, which is tantamount to an assertion, that meadows and pastures which we usually describe as poor and worn out, whether clays or light sandy soils, can be brought into rich, nutritious clovers, both red and white, simply and solely by the application of Alberts' Thomas-Phosphate Powder (Registered), and without the sowing of clover seed, is pronounced by Mr. Hobson as astounding. I can assure you that there was a time when I, too, was astounded by this phenomenon, but the practice of thousands of farmers in Europe and England, and very many in Canada under my own eyes, convinced me of the correctness and feasibility of this plan of improving herbage and obtaining rich stores of the nitrogen of the atmospheric air free.

To account for this remarkable phenomena in theory is not just the most important point, perhaps, and, while I have reasoned out a theory founded upon my observation, I am reluctant to go to it unless accorded more space than this letter should cover. I will explain, however, that on a field already rich in nitrogen, either from manuring with barn-yard manure, clover ploughed under, or nitrogenous chemicals, it is not generally the rule to immediately obtain clovers spontaneously. (This expression you will kindly permit in lieu of a better or more correct one scientifically.) This is ascribed to the habits of other kinds of plants, the graminaceae, we will say, finding plenty of available nitrogen in the soil and flourishing, filling the surface. But when the store of nitrogen in the soil is low, and if there is a sufficiency of potash, and there nearly always is; if there is also a plentiful supply of available phosphoric acid, clovers spring forth to gather from nature's great storehouse for nitrogen (the atmospheric air) a supply for the graminaceae, for as these clovers perform their function in the soil they seem to die out again.

When this peculiarity of clovers springing up from seemingly barren pastures and meadows as the result of manuring was first noticed, it was ascribed by most authorities to Thomas-Phosphate Powder and Kainit manuring, they being generally used together, as phosphoric acid and potash were the known principal alimentary substances clovers required for their perfect development. Even Henri Albert, the renowned head of the chemical manufacturers, H. & E. Albert, who first brought Thomas-Phosphate forward for manurial purposes, held that Kainit was necessary. The experiments of Wagner, followed by the practical use of the Thomas-Phosphate by thousands of farmers, gradually showed that only in soil deficient in potash (and these are few) was the Kainit necessary to the getting of clover, and it further developed by Wagner's experiments that clovers not properly supplied with phosphate and potash failed in storing any great quantity of atmospheric nitrogen. However, soils may have a lavish

supply of potash, which may be in such an insoluble form that few plants (and those only wildlings) could attack and assimilate it, but in such cases the rich supply of a fine form of very soluble lime in powdered state in the Alberts' Thomas-Phosphate Powder acted upon the soil-potash and rendered it readily available to the clovers. Thus it was found that without the assistance of Kainit, most soils in a poor state responded readily to the Thomas-Phosphate and produced rich clovers. A very important point to which I will now draw attention is the after-effect of such manuring. Occasionally we find soils so denuded of their phosphate that repeated dressings are necessary before the highest production is reached. This Prof. Wagner explains as being due to the fact that the first dressing is needed to do away with the state of starvation existing. These cases are, however, rare, and as a rule the action of Alberts' Thomas-Phosphate Powder is very prompt. In the second year after dressing the clovers develop much more richly, and even to an amazing extent, and also there is a noted improvement in the graminaceae. The third year is liable to show a slight falling off of the clover, but a decided and almost wonderful improvement in the timothy and other grasses, only those of the highest class developing. This is due to the store of nitrogen brought into the soil by the clover, providing a nitrogenous food for the nitrogen-consuming plants. (If clover is then still desired a further dressing of the phosphate is required.) Thus the after-effect of this manure for about four years very much lessens the yearly cost, and I think it is a fair way of looking at it.

The cost per acre of doing this thoroughly on a few acres is, of course, greater than in a large way, owing to freights, etc., but it costs from \$2.50 to \$5 an acre, according to the necessities of the soil; and in some very bad cases, such, for instance, as I found in Carleton county, N.B., it was from \$5 to \$7 per acre. This expense, as I observed, may fairly be divided as over about four years, and even much longer from the nitrogenous effect mentioned. The advantage gained is the doubling and trebling of the feeding value of the land, either in pasturage or mowing meadow. This has been proven beyond any doubt, and the figures for it are as follows:

Part of a meadow not manured with Thomas-Phosphate Powder produced about 6,000 pounds of hay, containing 450 lbs. flesh-forming constituent and 150 lbs. fatty matter. The other part of the same meadow, being equal in size, in the same season, manured with Alberts' Thomas-Phosphate Powder, produced about 12,000 pounds of hay, containing 1,610 lbs. flesh-forming constituent, 300 lbs. fatty matter, and twice as much phosphoric acid as the other part.

This, then, means that from an expenditure of from, say, at the utmost, \$2 to \$3 per acre per year, the produce of the acre is doubled in quantity, and more than trebled, in fact, almost quadrupled, in value. This same calculation extends to grain and roots in the same land, and it has been most positively proved that turnips grown with Alberts' Thomas-Phosphate Powder have a much higher value in making a finer quality of beef and mutton. But, on the clover question, I am prepared to pledge the guarantee of my firm that Alberts' Thomas-Phosphate Powder, at the rate of one ton to four or five acres, broadcasted this summer or fall on wornout meadow or permanent pasture, on such soils as are usually found in Ontario or the Eastern Provinces, will cause a rich growth of clovers next summer and fall, which will be further improved the following year, and an improved herbage for about four years. A second application will greatly enhance the value of the field.

As regards Mr. Hobson's question as to the practicability of expecting to have from poor, wornout land a crop sufficiently good to be worth plowing under for next fall's crop, I answer that the growth of clover on soils dressed with Alberts' Thomas-Phosphate Powder is so great that such is fully within the range of probabilities, if the party advised made an August sowing of clover, for which he had plenty of time when I advised him. I advise the use of a rather larger amount of the phosphate in such cases, say 600 lbs. to 700 lbs. per acre, as it should be well mixed through the soil and not so thoroughly concentrated about the roots as in broadcasting the meadow. As this letter has already "run away with space," I have transmitted to Mr. Hobson by mail my further proofs of my assertion. I know whereof I speak, and the practical application of the method I advise is well within my knowledge.

T. C. WALLACE.

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