



The Field.

Plaster and its Uses.

Plaster of Paris, or gypsum, is a manure of great value for certain soils and crops. It is found very abundantly in various parts of the world, and can usually be had conveniently and cheaply, by such as desire to use it. Chemically speaking, it is *sulphate of lime*, the composition of which, when pure, is:—

Sulphuric Acid.....	43
Lime.....	33
Water.....	24
	100

But plaster is commonly found united with a portion of silica and alumina, and it is this admixture doubtless, which renders it so useful for moulds, casts, house decoration, and other artistic purposes.

The employment of plaster as a manure, is of comparatively recent date. No mention is made of it by ancient writers on agriculture. Some think that there is a vague reference to an impure variety of it in Virgil, and it is also supposed that the earlier inhabitants of Britain used it, but this was ages before chemists had learned to distinguish this material from common limestone, and calcareous matter in general. According to the best authorities, a German clergyman of agricultural tastes, named Mayer, first called attention to the value of plaster as a top-dressing for young clover. This was about the middle of the last century. Tscheffeli, an eminent Swiss agriculturist, soon after tried a variety of experiments with it, the results of which were so successful, that the new manure speedily came into general use throughout Switzerland, where it still maintains its original reputation. Its fame spread all over Europe, and at length reached Pennsylvania, on the continent of America, where the most surprising results were produced by its use. The celebrated Benjamin Franklin is said to have been one of the first who tried its fertilizing efficacy on clover in the New World. He sowed it in a clover-field near one of the high roads in Pennsylvania, so as to form the letters of the sentence, "This is manured with gypsum;" and so marked was the effect in color and height of the clover thus treated, that the sentence was easily read, and proved a very telling advertisement for the new fertilizer. Some of the accounts of early experiments in Pennsylvania, are quite marvellous, and prove a very special adaptation of soil and climate to plaster. It is on record, that early Virginian wheat having been sown on exhausted land, at the rate of three bushels per acre, it yielded, under the influence of plaster, forty bushels per acre of the finest grain weighing 64 lbs. per bushel, and ripening before the earliest rye; that by spreading two bushels and a half of plaster on an acre, three times as much clover was grown as where it had not been sown; and that six bushels of

aster have been found preferable to fifty cart loads of the best dung. So highly was it esteemed, that it was imported from France, and conveyed by land carriage upwards of 150 miles from the Delaware, until at length beds were discovered in New York and other parts of the American continent. - Its use in the United States and Canada has been much more general and successful than in Great Britain, though it is highly prized by many distinguished British agriculturists. Our soil and climate, however, seem better suited to the action of this fertilizer than those of the old country, and the pity is that so valuable a manure is not more extensively used, especially as Providence has furnished ample supplies of it at our very doors.

The beneficial action of plaster on certain soils, is owing to its containing, in addition to lime, the important element of sulphur, which enters into the composition of nearly all parts of animals and vegetables, and is found in a variety of combinations, which render it available for plant-food. Some soils are sufficiently supplied with both lime and sulphur, and to these the application of plaster is needless and useless. Soils on which it does not act as a manure, are invariably found to be well supplied with sulphate of lime. It is not, however, necessary to make a chemical analysis of the soil in order to ascertain whether it needs plaster or no. There are sundry simple tests which may be easily applied even by the unscientific farmer. These are well enumerated by Cutlbert W. Johnson as follows:—"When he finds that those fields, which once produced luxuriant crops of red clover or sainfoin, will no longer yield them in abundance; if he notices that the young plants spring up very numerous, but die away as the season advances, if he finds that his fields will only grow clover successfully once in 8 or 12 years, and that his neighbors tell him that his land is tired of clover, or "clover-sick," if he notices that even the application of farm-yard compost hardly adds to the luxuriance of his grasses; he may then safely conclude that his crops have exhausted his land of sulphate of lime, and he may, with every confidence of success, apply a dressing of gypsum, at the rate of two cwt. per acre, taking care to secure a damp morning for the application, and this may be done at any season of the year, but is best either in April or the first days of May."

The soils to which plaster is best adapted, are those of a light, dry, sandy, gravelly or chalky character. Heavy loams, clays and wet land seem to derive no benefit from it. Heavy loams that have been well limed, form an exception to this remark. The effect of this fertilizer, itself calcareous in nature, on soils already impregnated with similar matter, is one of the mysteries of nature which chemistry, with all its researches, has not succeeded in finding out. Indeed, all the explanations ventured in regard to the action of plaster, are little better than guesses at the truth.

Some think it attracts moisture. Others think it checks the action in plant leaves. Others contend that it liberates and decomposes plant-food already in the soil. Others, and among those the distinguished Liebig, maintain that it fixes the nitrogen or ammonia which is brought into the soil, and stores it there for the use of vegetation; hence the long continued action of gypsum year after year. Others tell us it liberates the potash in the soil. Still others attribute to plaster the function of drawing to plants, on which it is strewn, various fertilizing gases that float in the atmosphere. We shall discuss none of these theories. The fact of the utility of this fertilizer is undeniable, when applied to such soils as have been specified. It has been proved that in a most efficacious, though inexplicable manner, it acts upon particular crops, as well as upon certain soils. The facts which have been demonstrated, time and again, are a sufficient guide for all practical purposes.

The plants to which this fertilizer is best suited, are those of the broad-leaved, leguminous classes, such as clover, peas, beans, vetches, lucerne and sainfoin. All these plants contain gypsum or sulphate of lime in sensible proportions. Analysis of clover and sainfoin grasses has shown that an ordinary crop of these usually contains from 1½ to two cwt. per acre of sulphate of lime, and this is the proportion of plaster which experience teaches is of the most benefit to the growing crop. The annual repetition of this dressing is followed by renewed benefit. Here the chemist and farmer confirm and illustrate each other. The amount of sulphate of lime which a clover crop takes off, is precisely that which it is found useful to supply as an annual application of plaster. Other crops besides those mentioned, have often had this fertilizer applied to them with the best results. Oats, Indian corn, rape and turnips are benefited by it. But it is on red clover that plaster achieves its grandest effects, and whether as a rotation with wheat, a means of amendment to an impoverished soil, or as a simple product for profit it pays to use it on this crop, and it is indeed the poorest economy possible not to do it.

Much of the efficacy of plaster has been found to depend on the state of the weather at the time of its application. Both a wet spell and a drought are unsuitable seasons. It is recommended to sow it in the evening, or early in the morning, or just after a shower, as it is found that much benefit results from its adhering well to the leaves. A gloomy, hazy day is a good one for the job. From 100 to 200 lbs per acre may be sown according to the condition and requirements of the land and crop. The value of the plaster as a manure may be greatly increased by adding dry unbleached wood ashes in the proportion of one bushel of ashes to four bushels of plaster.

It may be interesting and instructive to some of our readers to mention, in conclusion, a few particulars concerning the natural history of gypsum, and the mode of its preparation for market and use. It is found in the form of a hard, white, opaque rock. Its geological place is among the stratified rocks. It is quarried, subjected to strong heat in a kiln to drive off the moisture and make it brittle, and then ground in a mill constructed for the purpose. The finer it is pulverized the better it is for fertilizing uses. When first ground, it is very dry, but it quickly imbibes moisture from the atmosphere, which adds greatly to its weight. It is found in considerable abundance at Paris and York on the Grand River, in the Province of Ontario, whence it can be readily shipped to any locality where it is wanted. The whiter the plaster the better it is considered. There is a greyish article that is low in price, but it is regarded as of inferior quality, the darker color indicating impurity.