

Many theories have been published on the manner in which lime acts in producing fertility, and much has been spoken and written as to the peculiar manner in which it manifests its utility. A report like the present, designed to be merely practical in its nature, affords no opportunity to discuss these questions.

Let it be sufficient to say, that it should *always* be applied to a soil when it is not already present in sufficient quantities, and never applied when it is. This short remark comprises all of the rules for the necessity of its administration—further remarks would be unnecessary.

MAGNESIA.

Is the oxide or rust of a metal called magnesium, and its necessity to fertile soils is supported by facts as well established, evidence as conclusive, and testimony as convincing, as those which show the use of lime, potash, or any other constituent.

Like lime, it loses its carbonic acid when exposed to a high degree of heat in a current of air, and becomes caustic or calcined magnesia. It remains in this condition much longer than lime, as it imbibes carbonic acid with much more difficulty from the atmosphere. It also unites to water, but with much less intensity than lime, producing but a very slight degree of heat, whilst the union is being accomplished. Magnesia, for agricultural purposes, is obtained from a rock called dolomite, and is found associated with lime, both existing in the state of carbonate.

The proportion of lime and magnesia in this rock vary in the different localities, and even in different parts of the same rock; and the ratio of their ingredients is very variable, "since isomorphous substances crystallize together in all proportions." We can only estimate the quantity of each, and the particular adaptation of a limestone to the soil by a quantitative chemical analysis.

The belief is very generally diffused, that magnesia, instead of being a necessary constituent of a fertile soil, and an essential part of the composition of plants, injures the quality of the one, and proves detrimental to the growth of the other.

To correct this erroneous impression as far as I can, and show how far it is useful, and when it may be injurious, when it should be applied, and when withheld from a soil, I will briefly review the arguments against its use, and let the facts which I shall offer, urge its application.

Sprengle says, that soils containing much of the carbonate of magnesia are said to be highly absorbent of moisture, and to this cause is ascribed the coldness of such soils. This absorbent property of magnesia, so far from being an objection against, is a recommendation for its use, as we find many soils deficient in this property, being light, loose and porous,—deficient, in the two great *absorbers* of food from the atmosphere, clay and the peroxide of iron, and not having a sufficiency of fine sand to effect the vicarious action of these substances. Here, then, for its me-