LIMING IN ITS RELATION TO INJURIOUS INORGANIC COMPOUNDS IN THE SOIL.¹

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Lime in its various forms is known to affect soils in a great many ways, both chemical and physical. This paper is confined to a discussion of the action of lime, both calcium and magnesian, in various forms in decreasing the injurious action of inorganic compounds which may be in the soil. There are three ways in which lime is known to lessen the harmful action of injurious compounds.

It will neutralize acids in the soil and in this way decrease the hydrogen ion concentration.

It will precipitate many soluble injurious salts.

It in some cases exerts a so-called and not very well understood antagonistic action towards soluble injurious compounds which may or may not remain soluble.

The Reduction of Acidity.

Several forms of lime reduce acidity more or less. Together with the corresponding magnesium compounds, calcium oxide, calcium hydroxide, calcium carbonate, calcium silicate, and, to a slight extent, calcium phosphate exert such an action. This reduction of acidity is beneficial to most agricultural crops. It is now rather widely known, however, that it is possible to use too much lime for maximum results. There is a certain optimum range of H-ion concentration for the soil solution at which crops do best. This varies with different crops and in many instances is slightly on the acid side of neutrality.

The Precipitation of Soluble Salts.

Liming is the most common and cheapest method of precipitating soluble injurious compounds in the soil. The soluble injurious inorganic salts that are found in acid soils are the ones which are precipitated by lime. Among such salts may be mentioned aluminum, iron, manganese, zinc, and boron. Of all these, aluminum is by far

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