Soil chemists are often criticized because they do not agree upon which is the best method for determining soil acidity. Much of the confusion resulting from a consideration of the large number of methods proposed for the determination of soil acidity and lime requirement has been brought about through a lack of appreciation of what is being tested for in any given method. If all these methods were measuring the same thing, just as we have several methods for determining potassium, it might still be difficult to select the best, but with the various methods dependent upon different phases of the phenomena of soil reaction, the whole situation has become highly confusing. It is with the hope of clarifying this condition that the present discussion is being taken up.

The Nature of Soil Acidity

Acid soils occur in humid climates where the rain water has leached out a relatively large proportion of the basic elements of the original soil materials. Under arid and semi-arid conditions, acidity does not develop and the soils remain neutral or basic in reaction.

Soils are acid because of a preponderance of acid silicates or of acid organic compounds. As soils vary greatly in the proportion of acid mineral and acid organic matter they contain, and as those two groups of acid materials are different in their action upon crops, it adds to the confusion.

Most soil investigators agree that acidity phenomena are connected largely with the colloidal fraction of the soil. There has been some controversy as to whether such acidity is due to physical or chemical reactions. The tendency now is to consider both the mineral and organic acids of soils, although colloidal, truly acidic in nature. Michaelis says,¹ "We may call a colloidal substance which has the chemical characteristics of an acid, yet produces no discrete but only colloidal ions, an acidoid, in distinction from a truly soluble acid."

It is generally recognized that acid soils have the capacity of absorbing bases. We have used the term "absorption" in a general way including both chemical and physical effects or what is meant by both physical adsorption and chemical fixation. The term "sorption" is