A COMPARISON OF FIELD METHODS OF DETERMINING SOIL REACTION

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Due largely to improvement of methods, the interest in the estimation of soil reaction in the field has been revived in recent years. This in turn has stimulated the placing on the market of devices designed to meet the growing demand. Most of the new devices offered make use of the principle of color changes of acid-base indicators. In addition, some use has been made of color changes accompanying specific chemical reactions, such as that between soluble iron and potassium thiocyanate.

Historically, it is interesting to note that the first widely used field method of testing soil reaction also involved the use of an acid-base indicator, litmus. For many years, the litmus paper method was practically the only one used in the field. The NH₄OH method proposed by Müntz and cited by Lyon, et al. (2) depended on the presence of humified organic matter and never became popular in this country. Just when and by whom litmus was first used for testing soil reaction is not known to the writers. It is known, however, that it was used by Voelcker (6) as early as 1865. Due largely to the advocacy of its use by Wheeler and coworkers (7), who used it in testing acid upland soils of Rhode Island in the 1890's, it became popular among the soil workers of the United States in the first part of the present century.

Litmus paper was used for testing soil reaction almost exclusively until the advent of Truog's (5) ZnS method in 1914. In 1920, Comber's (1) method was published, and in 1924 Spurway (4) showed how the indicator brom-thymol blue could, with facility, be used in testing the reaction of soils in the field. Since then, several devices have been placed on the market under various trade names, all making use of indicators in some way.

Also, some attempts, accompanied by more or less success, have been made to use the potentiometer in the field. Since equipment involving the use of the potentiometer is very expensive as compared with that using indicators, and also cumbersome to handle in the field, it is unlikely to be widely used for field work. However, there may be special conditions under which electrometric methods can be effectively used in the field.

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3 Reference by number is to “Literature Cited,” p. 1108.