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STUDIES ON NITROGEN FIXATION IN SOME IOWA SOILS

R. H. WALKER

In studies on the bacteriological activities in soils treated with various kinds and amounts of lime, the question as to the relative importance of the two groups of nitrogen fixing bacteria, the aerobic and the anaerobic, has been brought to our attention. Ever since the discovery of the aerobic *Azotobacter* organisms they have been considered to be of the greatest economic importance in cultivated soils. But in spite of this belief, it has been known that the aerobic organisms are entirely absent in many soils and relatively inefficient in others.

On the other hand, although the anaerobic organisms may be present in most soils it has been considered that they were relatively unimportant except in certain abnormal soils such as those that are poorly drained and unsuited for the economic production of crops. In recent years, however, some investigators have been led to believe that the anaerobic nitrogen fixers are of greater importance in adding nitrogen to soils than has generally been considered possible. No conclusive evidence has been secured on this subject.

In this connection, some interesting points have been brought out in our studies on nitrogen fixation. The results indicate that it is very probable that too little credit has been given to the anaerobic nitrogen fixing bacteria of the *Clostridium* group in adding nitrogen to cultivated soils, and probably too much credit has been given to the aerobic organisms of the *Azotobacter* type. It may also be pointed out that an investigation into the question of the actual importance of these two groups of nitrogen fixing organisms in maintaining the nitrogen supply of field soils would be very desirable.

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