A METHOD FOR THE GROWTH OF LEGUMINOUS PLANTS UNDER BACTERIOLOGICALLY CONTROLLED CONDITIONS

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The culture of higher plants in the absence of micro-organisms has engaged the attention of plant physiologists, agronomists, and bacteriologists for many years. The importance of the exclusion of contaminating organisms in studies of plant physiology has led to the development of numerous methods for growing plants in an environment free of micro-organisms. This paper will not attempt the review of the voluminous literature on the subject since this has been done quite adequately by Klein and Kisser (4) and by de Zeeuw (7). One even hesitates to add to this impressive array of devices that seek to keep out the ubiquitous organisms of the soil and air. However, many of the methods involve such complicated set-ups as to render them unsuitable for numerous experiments or ready manipulation, and others, with more simple arrangements, often fail to accomplish their purpose. The technic described in this paper contains features already noted in the literature, but certain modifications and additions have been developed which, it is thought, will be of value to other research workers.

The method used to grow the plants makes use of glass containers, closed with cotton plugs. It was found that the best results were obtained with bottles having small necks. However, this limits the applicability of the method to the smaller plants. The technic described has been developed and tested for small legumes, such as the clovers and alfalfa. For successful application to larger plants certain modifications would be necessary.

For discussion, the procedure can be divided into three sub-heads, viz., (a) sterilization of the seed, (b) transfer and growth of plants in suitable containers, and (c) tests for sterility at the completion of the experiment. In this discussion “sterility” as applied to seeds or plants is used in the sense of freedom from micro-organisms as indicated by standard bacteriological tests.

Published January, 1931