areas periodically receive suboptimal amounts of precipitation. Study of physiology of plants under water-stress is a prerequisite to an understanding of water economy and drought tolerance.

2. Also needed in the Western Hemisphere is a study of the effects of temperature on the physiology of plants. Such a study is an understanding of frost resistance and of the growth limitations imposed by temperature thresholds.

3. A third specific problem, particularly relevant to plants growing on soils of the tropical areas of the Western Hemisphere, relates to restricted rooting volume due to low base status, soil acidity, and aluminum toxicity. Basic physiological studies of root growth-root rhizosphere interaction are needed.

4. Nitrogen often is the element that limits primary production, yet the atmosphere contains a vast reservoir of this element in a form utilizable by only certain systems. As part of the IBP program, it is essential to encourage pertinent research bearing on the problems of nitrogen fixation. In particular, it is essential to have these aims:

   a. To assess quantitatively the magnitude of nitrogen on both a regional and a world-wide basis. The studies should give attention to great world soil groups and climates and to the evaluation of fixation in the hydrosphere. Standardization of methods and the coordination of studies with those of other national programs are particularly desirable.

   b. To determine the factors that influence fixation and limit its rate and magnitude. Special attention should be given to the role of nitrogen fixation in limiting primary production.

   c. To evaluate the potential for nitrogen fixation in inadequately investigated areas (e.g., in the Tropics, in the Arctic zone, and in hydrosphere).

   d. To determine the distribution of the organisms or symbiotic associations which bring about the fixation of nitrogen. The studies

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