Recent studies have shown that corn will make good growth in soils whose displaced solutions contain only small amounts of phosphate. Other studies have shown that corn will make good, but not optimum, growth in culture solutions whose phosphate concentration is only 0.25 p.p.m. PO₄. Those studies, however, have not proved that corn will make a satisfactory growth in culture solutions whose phosphate concentration is as low as that of some rather productive soils. It is essential that it be definitely established whether plants will grow in culture solutions of as low a PO₄ concentration as in displaced soil solutions of productive soils. If it is proved that plants will not grow in culture solutions of as low a PO₄ concentration as is found in some productive soils, it will indicate a difference in the absorptive process in the two media or that the displaced solution is not the true soil solution from which the plant absorbs all of its nutrients. The establishment of such a fact would, therefore, result in some doubt as to the value or interpretation of past work on the displaced soil solution and on the value of the culture solution method for studying problems of plant nutrition involving the soil-plant relationship.

This paper will deal briefly with (a) the minimum phosphate concentration for maximum plant growth in culture solutions, (b) plant growth in soils whose displaced solutions contain only small amounts of phosphate, and (c) the inadequacy of the phosphate in the displaced soil solution for plant growth.

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