I. INTRODUCTION

Irrigation poses some special problems in the use of fertilizers and also provides some unique ways to supply nutrients not encountered in nonirrigated agriculture. First, irrigation imposes a greater demand for fertilizer nutrients. For irrigation to be profitable, yields must be high. Higher yields mean greater nutrient uptake by crops with the nutrient uptake being roughly proportional to the crop yield (see chapter 24). The increased needs for N were discussed in a recent review (Viets, 1965). Therefore nutrient needs for irrigated crops must be met by an adequate fertilizer program if irrigation water is to be used efficiently (Viets, 1962).

The movement of soluble nutrients in the soil and their availability to plant roots are highly dependent on the method and frequency of irrigation. Some basic aspects of nutrient availability in relation to soil water suction were discussed in chapter 24. On the other hand, irrigation itself often provides a convenient and economical method of fertilizing the crop.

The purpose of this chapter is to discuss some of the special problems of nutrient movement arising from irrigation, some of the fertilizer problems posed by the choice of irrigation method, and the application of fertilizers in irrigation systems. No further mention is made of fertilizer requirements as affected by crop yield, but it should be emphasized that the failure to meet increased fertilizer requirements is one of the more common faults of new irrigation projects. Some nutrients are applied to crops as foliar sprays dissolved in water, injected into soils in water, or applied in water to the roots of transplants; the use of water in this sense can scarcely be called irrigation and is beyond the scope of this chapter.