Efficiency of Fertilizer Nitrogen Use as Related to Application Methods

Nitrogen fertilizer will undoubtedly become more expensive in the future because of escalating costs of natural gas, due to difficulty in obtaining sufficient amounts of gas and deregulation of the natural gas industry. Recent information suggests that the cost of NH3 will more than double during the period 1980 to 1985 (Douglas, 1981). We can expect these higher costs to be passed on to the farmer. This extra cost of N will occupy a greater portion of each grower's variable crop production costs and will not be offset unless commodity prices increase commensurately.

It is unlikely that the prices growers receive for their commodities will increase as rapidly as the potential increase in fertilizer costs. Thus, it becomes more important than ever for the grower to maximize the efficiency of his fertilizer N to maximize his profit. Sometimes this efficiency can be improved simply by using better application methods or techniques that fit current crop production systems more precisely than some of our older, more traditional methods. The purpose of this chapter is to discuss and present data showing: (i) various N application methods, (ii) how N efficiency may be improved as we change application methods, and (iii) how N efficiency, as affected by application method, is highly dependent on the crop, climatic conditions, and the soil in which that crop is grown.

For the purposes of this chapter, efficiency will be defined very simply: either obtaining (i) greater crop yield and N uptake with equal or lesser